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ABSTRACT

The purpose of this study was to explore an American model (Harris 1986) of effective classroom teaching behaviors as a framework for teachers' professional growth. The particular focus was on the self-assessment component of the methods related to the model. An empirical approach was adopted, and comparative data were gathered from American and Finnish teachers using a common self-evaluation instrument. The study identified and analyzed cross-cultural differences and culture-specific behaviors. The analysis revealed that a complete fit between the model and the data could not be found. Discriminant analysis revealed interesting differences in the evaluation of teachers from different teaching traditions. The American teachers were found to be much more dynamic in their classroom behavior than their Finnish colleagues; Finnish teachers reflected their academic tradition well by giving much more emphasis to a "businesslike" type of behavior. The research is presented in eight chapters as follows: (1) Introduction; (2) Teachers' professional development; (3) The reform traditions; (4) Methods for helping teachers' professional growth; (5) The empirical framework; (6) Cross-cultural validity of the Harris model; (7) Dimensions of teacher classroom behavior; and (8) Discussions on methodology and conclusions. Appendixes provide a copy of the questionnaire in English and in Finnish, and computer listings for chapters 6 and 7. (Contains approximately 175 references.) (Author/LL)

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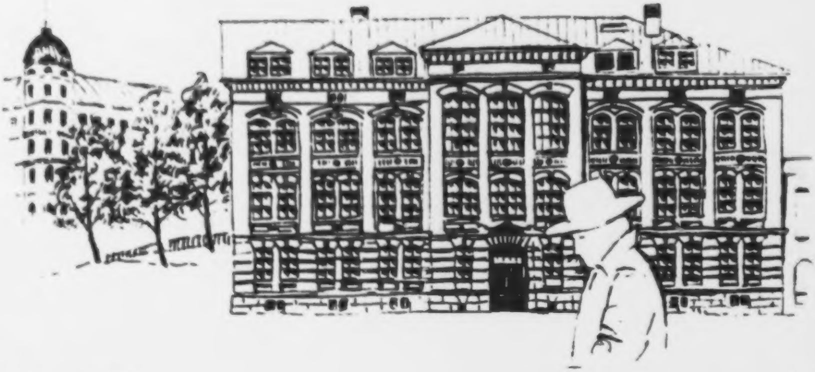
Kirsi Tirri

EVALUATING TEACHER EFFECTIVENESS BY SELF-ASSESSMENT:

A CROSS-CULTURAL STUDY



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Evaluating teacher effectiveness by self-assessment:
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ABSTRACT

The purpose of this study was to explore an American model of effective classroom teaching behaviors as a framework for teachers' professional growth. In particular, the study has focused on the self-assessment part of the methods related to the model. Due to the instrument reliability and validity issues raised, the main focus of the study has been the validity of the model behind the criteria used. Since the model is based on the American research tradition, the cross-cultural issues related have especially been analyzed. Identifying culture-specific behaviors also contributes to solving the general problem of adapting instruments from different countries.

In the study an empirical approach was adopted and classroom teaching data from American and Finnish teachers was collected using a common self-evaluation instrument. This data was analyzed by various statistical methods including factor and discriminant analysis.

The analysis revealed that a complete fit between the model and our data could not be found. A detailed analysis of the data by factor comparison indicates that the observed model bias towards the American teaching tradition is likely to be more a property of the particular grouping of primary factors than of the primary factor structure. The discriminant analysis revealed interesting differences in the evaluations of the teachers from the different teaching traditions. The American teachers were more dynamic in their classroom behavior than their Finnish colleagues. On the other hand, the Finnish teachers reflected their academic tradition well by giving much more emphasis to "businesslike" type of behavior.

Keywords: teacher effectiveness, teachers' professional development, self-evaluation, comparative education, teacher education reform traditions, cross-cultural approach, criteria for effective teaching.

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Helsinki, October 1993.
Kirsi Tirri

TABLE OF CONTENTS

1. Introduction **5**
- 1.1. Purpose of the study 5
- 1.2. Context of the study 6

2. Teachers' professional development **10**
- 2.1. The Pickle model 11
- 2.2. Current trends in teacher education reform in the United States 13
  - 2.2.1. National commission reports of the 1980s: The crisis in the American Educational system 13
    - 2.2.1.1. Reflections on the recommendations of the national commission reports 16
  - 2.2.2. A reflective teacher as a goal in teacher education 19

3. The reform traditions **21**
- 3.1. A pedagogically thinking teacher as a goal: the academic tradition 22
- 3.2. An autonomous teacher as a goal: the developmentalist tradition 25
- 3.3. A socially active teacher as a goal: the social-reconstructionist tradition 28
  - 3.3.1. A politically active teacher as a goal: critical pedagogy 28
  - 3.3.2. A researching teacher as a goal: inquiry-oriented teacher education 29
- 3.4. An effective teacher as a goal: the social-efficiency tradition 32
- 3.5. Some observations on teacher education deriving from different reform traditions 37

4. Methods for helping teachers' professional growth **41**
- 4.1. Supervision for teachers 41
- 4.2. Inservice training for teachers 43
- 4.3. Action research 44

4.4 School consulting 46
4.5. Professional development schools 47
4.6. Teacher portfolios 49
4.7. Self-evaluation 51
5. The empirical framework 53
5.1. General focus of the research 53
5.2. The measuring instrument 55
5.2.1. The DeTEK model 55
5.2.1.1. The structure of the DeTEK process 57
5.2.2. Selecting criteria for good teaching in the DeTEK model 59
5.2.3. DeTEK criteria for good teaching in the light of current research on effective teaching 62
5.2.4. The modified version of DeTEK's self-evaluation instrument 71
5.3. Evaluation data 72
5.3.1. The US data 72
5.3.1.1. Indiana data 74
5.3.1.2. Texas data 74
5.3.2. The Finnish data 76
5.3.2.1. Kajaani data 76
5.3.2.2. Helsinki data 76
5.3.2.3. Subject specific data 77
5.4. The analysis methods 78
5.5. On validity 82
6. Cross-cultural validity of the Harris model 89
6.1. The general approach 89
6.2. Differences in the basic statistical indicators 90
6.3. The factor structure for the complete data 92
6.4. The factor structure for the US data 99
6.5. The factor structure for the Finnish data 105
6.6. Obtained structure vs. the Harris structure 112
7. Dimensions of teacher classroom behavior 116
7.1. The general approach 116
7.2. Factor analysis results for the complete data 117
7.3. Factor analysis results for the US data 123
7.4. Factor analysis results for the Finnish data 129

7.5. Second order factorization 135

7.5.1. Second order factors for the US data 135

7.5.2. Second order factors for the Finnish data 139

7.6. Factor structure comparison 142

7.7. Cross-culturality as a discriminating factor 147

8. Discussion **154**

8.1. Discussion on Methodology 154

8.2. Discussion on Conclusions 156

References **159**

Appendix to Chapter 5 **174**

Appendix to Chapter 6 **189**

Appendix to Chapter 7 **190**

Chapter 1

INTRODUCTION

1.1. PURPOSE OF THE STUDY

The purpose of this study is to examine a model of effective classroom teaching behaviors (Harris 1986) in the context of teachers' professional growth. The complexity of effectiveness research has produced many different methods and models for studying effective teaching (Jeans 1992). There is no all-purpose model that can be adopted in the study of effective classroom behaviors that would comprehend all the dimensions of good teaching. Each of these models reflects some particular facet of effective teaching but none captures the complexity of life in the classrooms which includes personal, situational and moral dimensions. Thus any single model adopted is an oversimplification of the whole school's functioning. Acknowledging these limitations leads any researcher to focus the research question by reducing the complexity of the phenomenom under investigation. Hence such a study tends to reveal more the general guidelines and tendencies of the phenomenom than the overall picture involved.

The model studied here is based on American teaching effectiveness research, mostly from the 1960s and 1970s. Hence in the theoretical part of our work we aim at placing the model in the modern theoretical context by exploring the different reform traditions that have affected American and Finnish teacher education in recent years. From this survey we make an effort to identify common aspects from the various traditions.

The model in question relies on a wide spectrum of methodologies that support teachers' professional growth. In this work we have focused on a particular method, self-assessment. This emphasis can be justified by its relative merits against for instance a complete evaluation system: it is low-cost, easy to administer and is widely applicable. However, with such an approach the typical problems of instrument reliability and issues of validity have to be considered. Building an instrument based on a set of behavior criteria for effective teaching can always be criticized for its reliance on the criteria selected. Thus one of our main concerns is the validity of the underlying model. Since the model is mainly based on the American research tradition, we focus on the possible differences in applying the model in different teaching traditions ; i.e., much of our discussion concentrates on cross-cultural issues related to the model.

Studying the differences in various traditions affects our choice of methodology so that, we have performed an empirical study to complement the theoretical inquiry. Data from American and Finnish teachers was collected using the same self-evaluation instrument used by teachers to rate their classroom teaching behaviors. This data was analyzed by using various statistical methods ranging from factor analysis to discriminant analysis. As usual, in our work the most important contribution from the use of a statistical methodology does not come from the detailed results themselves, but from the new topics raised and tendencies revealed. Such issues give information about the many-faceted nature of the concept of effective teaching in different teaching traditions.

In general our research can be understood as part of a larger framework that studies teachers' professional development since in developing self-evaluation instruments for teachers we aim to help them to grow in their profession. Consequently the advantages of self-evaluation compared to other remedies for professional development purposes are also discussed. In addition, by identifying culture specific behaviors, our cross-cultural study contributes to the general problem of adapting or borrowing instruments from different countries.

1.2. CONTEXT OF THE STUDY

In our work we conform to the tradition of a broad version of social-efficiency reform in teacher education as identified by Liston & Zeichner (1991), which is discussed in more detail in Chapter 3 (Section 3.4). As we have adopted the comparative approach to our study, our research is also related to studies in comparative education. More precisely, according to Halls's typology our work contributes to the subdivision of comparative studies called comparative pedagogy. In such a typology, comparative pedagogy is defined as "the study of teaching and the classroom process in different countries" (Halls 1990, pp. 24). In our study we aim at identifying the cultural differences in teaching practices by investigating the classroom behaviors of American and Finnish elementary teachers.

In the general area of comparative education one can identify several differing approaches with varying methods in their study. We base our brief review of these trends on Hall's classification (Halls 1990, pp.31-65).

The historico-philosophical approach in comparative education is the oldest. The pioneers in the field traveled to distant countries to explore foreign educational systems and their contexts. The studies were mostly descriptive and explanatory. Before describing the educational events, they were first set against an historical background and the genesis of different types of schools, educational philosophies, and school systems as parts of series of political and social events. Advocates of such an approach include Kandel (1933), Ulich (1961) and Kajava (1960). Recently this trend has not been very prominent in the comparative studies as opposed to the research tradition in socialist countries, where the historical conditions are heavily emphasized (Halls, 1990, pp.31).

The national character approach is closely related to the historico-philosophical trend. The main emphasis in this approach is on "national identity" as the key in understanding a nation's special educational characteristics. Mallinson is one of the leading advocates of this approach with his concept of "national character". In this context national character can be defined as the common characteristics the members of a nation share which determine their behavior (Mallinson 1961). This approach has had, and still has, advocates but cannot be considered as a leading trend in today's comparative education.

The culturalist approach builds in part on Hansian factors (Hans 1949): language, race, religion, geographical territory and ideology. It argues that a cultural typology must give rise to a similar educational typology. In the study of comparative education cultural and educational features must be linked, and the interaction between the dominant political ideology in a society and its educational system needs to be highlighted (Halls 1990). One of the most famous advocates for this approach is King (1973). He acknowledges these contextual elements and advocates pragmatic comparative education. The value of comparative studies can be judged by their practical use, providing the grounds for informed decision making.

The best-known advocate of the **problem-solving approach** is Holmes (1981). He has defined the steps in the problem-solving approach: problem analysis, hypothesis, specification, the logical prediction from adopted hypotheses with likely outcomes and finally the comparison of logically predicted outcomes with observable events. Holmes is a comparative educationist who views his field as applied science and joins the researchers in the quantitative approach in his methodological preferences.

The quantitative approach in comparative education can be considered more a method than an approach. It uses the methods of the social sciences to collect comparative data and analyzes it with the help of statistical methods. The main advocates of this approach in comparative education have been for example Noah & Eckstein (1969), Bereday (1964) and Anderson (1969). A process-product research paradigm is often applied to test hypotheses about the relationships between educational variables and political, economic, and social characteristics. A great interest is shown in the methodological aspects of empirical social science research. According to Halls Noah recently identified a four-stage process: to identify, validate and measure variables; show the connection between the variables in each country; compare these relationships cross-nationally; explain and generalize, using other concepts (e.g. national character) as necessary (Noah 1985).

This approach still dominates the field of comparative education. The largest project in comparative education using the quantitative approach is the IEA Study (International Association for the Evaluation of Educational Achievement). The project started in the late 1960s and has plans to carry on through the 1990s. This project is devoted to cross-national assessment of student achievement in selected school subjects and attempts to explain variance in such achievement. The first project was a study of mathematics achievement in 12 countries (Husen 1967). One of the studies, the IEA classroom environment study, which is part of this project will be discussed in more detail in Chapter 5 below.

For our work we have adopted the quantitative approach to our comparative study of the cultural differences in the classroom behaviors of American and Finnish teachers. For our purposes the main dimension of comparison is between nation-states, which has been and still is the most common dimension of comparison (Halls 1990, pp.29). Intra-national comparison is also attempted by comparing the teaching behaviors of teachers from two different states of the USA, Texas and Indiana.

Chapter 2

TEACHERS' PROFESSIONAL DEVELOPMENT

Recently the professional development of teachers has been a widely discussed topic among educators both in United States and in Finland. A teacher's growth toward maturity can be seen as a process which begins during teacher training and continues as long as the teacher is teaching (Burke 1987), (Anon. 1989, pp.26). At present no full-blown theory of teacher development exists. The developmental approaches to the study of teacher improvement either stop short of linking developmental theory to the change in teaching behavior in practice, or describe these changes without offering an encompassing theory.

At least three distinct approaches to the study of teacher development appear in the literature: a model of changes in teacher concerns (Fuller 1969), a model based on cognitive-developmental theories (Sprinthall 1980), and a style of inservice education emphasizing teachers' own definitions of their needs (Feiman-Nemser & Floden 1986, pp. 521-522). For our purposes these approaches represent interesting alternatives to the one adopted in this thesis, the Pickle model (Pickle 1985) discussed below. A more detailed discussion of these alternatives can be found in (Feiman-Nemser & Floden 1986).

According to the Finnish committee on the development of teacher training, the growth process includes development of the teachers' cognitive processes, strengthening their identity, increasing their understanding of moral values and attitudes, and preparing them for the teaching profession (ibid. 43). The committee has identified the following goals for teachers' professional growth:

The teacher is supposed to advance

1. from technical teaching skills toward understanding educational theories, philosophy and scientific research,
2. from imitation and insecurity in school situations toward understanding himself and others, and finding a personal teaching style,

3. from concrete thinking toward abstract and critical thinking and developing a perspective (ibid.43).

2.1. THE PICKLE MODEL

The goals for teachers' professional growth as identified by the committee are based on the model of professional development presented by Judy Pickle (1985). Pickle's model has been adapted to the study of teachers' professional development in Finland (Niemi 1989). The modified model preserves the three dimensions originally identified by Pickle. Uusikylä (1990) has also used Pickle's model in his follow up study of the development of Finnish teacher education students. He finds Pickle's model very suitable in describing the features of a theory-based, scientific teacher education program (Uusikylä 1990, pp. 10–14). For our purposes the Pickle model is useful as it includes the professional dimension with technical skills, the area that is the topic of the study in hand. In Pickle's model professional maturity consists of three domains: professional, personal, and cognitive process (Pickle 1985, pp. 55-59).

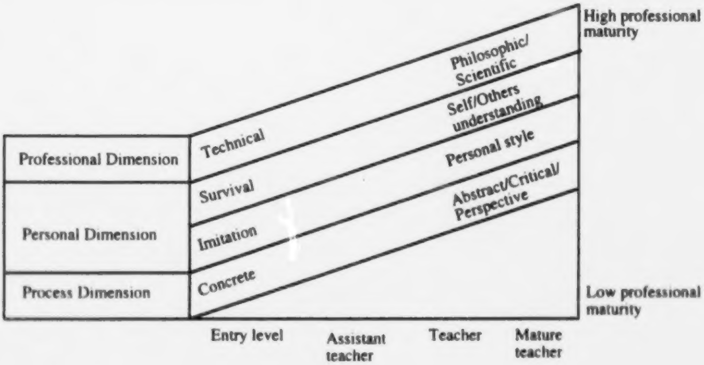
High professional maturity
Philosophic/ Scientific
Self/Others understanding
Personal style
Abstract/Critical/ Perspective
Professional Dimension
Technical
Survival
Personal Dimension
Imitation
Process Dimension
Concrete
Low professional maturity
Entry level
Assistant teacher
Teacher
Mature teacher

Figure 2.1. Preservice through inservice developmental factors toward teacher maturity (Pickle 1985).

The professional dimension in the teaching profession includes planning, implementation and evaluation aspects of the teaching process. The teachers also need didactic and educational knowledge to be able to act in their profession. At the early phases professional knowledge takes the form of purely mechanical application and teaching consists of practising only technical skills in the classroom. As the teacher matures he should advance from technical knowledge toward understanding the theory and philosophy of teaching. The goal should be that the teacher develops his own philosophy of teaching and acts according to it.

A prerequisite for this is that the teacher should understand the influence of his teaching on the whole society. A mature teacher is responsible for his own teaching and students and reflects on teaching critically. An essential part of the teacher's professional growth is self-evaluation.

The personal dimension includes the teacher's view of himself and his self-worth (Niemi 1989). A teacher is seen as an active agent who is constantly making decisions while planning and implementing his teaching. Moral values and attitudes are important factors within the personal dimension because they guide the teacher's decision making process.

At the beginning of his career the teacher has not found his identity as a teacher and he imitates the teaching models he has seen. As he reaches maturity the teacher finds his own personal teaching style which is in accordance with his philosophy of teaching. The teacher develops more and more understanding of himself and others. Before a teacher understands his own emotions and defense mechanisms, his biggest problem might be how to "survive" in the classroom situation. The teacher's whole energy is used to observe his own behavior. A more mature teacher concentrates on his students and the continuous development of his own teaching instead of looking at himself (Fuller 1969).

Cognitive processes (the Process Dimension in Figure 2.1) describe the way in which a teacher acquires and uses information. We can assume that the teacher's cognitive structures affect the way he guides his students' information acquisition. In early teacher training concrete thought corresponds to an emphasis on techniques. The teacher aggregates facts without being able to ascertain principles and generalizations. The teacher's thinking is at a very concrete level and he can't reflect on his own teaching critically. As the teacher matures, higher level cognitive processes take precedence and the teacher can think abstractly and critically.

One way to support the development of teacher information acquiry is through scientific training. Teachers need a strong theoretical knowledge base to be able to view different kinds of school situations with the broadest possible scope.

According to Pickle's model, the professional development takes place within a dimensional hierarchy. The goal of teachers' professional development is to allow an individual to become capable of developing the teaching profession independently of outside influence. The growth process is individual, and can occur at a different rate among individuals. The various dimensions of professional development interact with each other, and the speed of growth in each of these areas can vary considerably.

The teacher's development doesn't have any specific ending point - it should be seen as a lifetime process. The major changes in the society, and the changing image of the teaching profession require constant self-evaluation, and growth in the profession.

2.2. CURRENT TRENDS IN TEACHER EDUCATION REFORM IN THE UNITED STATES

2.2.1. NATIONAL COMMISSION REPORTS OF THE 1980S: THE CRISIS IN THE AMERICAN EDUCATIONAL SYSTEM

The quality of the educational system in the United States has been strongly criticized by educators and the public since the release of the national reports. The first and perhaps the most important of the reports, A Nation at Risk, National Commission on Excellence in Education (National Commission on Excellence in Education 1983), accused American students and teachers of mediocre educational performance. According to the report, this "mediocrity" has helped Japan and Germany outpace the American economy and has threatened national security. (National Commission on Excellence in Education 1983, pp.5)

Among its recommendations, the commission made several recommendations:

- more rigorous high school studies,
- higher standards for college admission,
- a nationwide system of standardized achievement tests, more homework,
- longer school days and years,

- increased teacher salaries,
- career ladders,
- incentives to attract top students to teaching, and
- states and localities governing and financing reform efforts.

The report strongly criticized teacher education with two recommendations directly related to teacher education:

1. "Persons preparing to teach should be required to meet high educational standards, to demonstrate an aptitude for teaching, and to demonstrate competence in an academic discipline. Colleges and universities offering teacher preparation programs should be judged by how well their graduates meet these criteria."

2. "Master teachers should be involved in designing teacher preparation programs and in supervising teachers during their probationary years" (National Commission on Excellence in Education 1983, pp.30-31).

Many other studies and documents were released in that same year 1983 (for example: Making the Grade, Educating Americans for the 21st Century, America's Competitive Challenge). Sikula (1990) has sampled and analyzed these reports calling them the first wave, which focused on public education.

In the second wave the focus was on teacher preparation (Sikula 1990). The two most influential reports issued were "A Nation Prepared: Teachers for the 21st Century", (Carnegie Forum on Education and the Economy, Task Force on Teaching as a Profession 1986) and "Tomorrow's Teachers", The Holmes Group (Holmes Group 1986).

The Carnegie Forum on Education and the Economy assembled a 14-member task force to examine teaching as a profession. The report viewed teachers as the key to reform. Task force goals were to attract able young people to teaching, to prepare them better, to give them greater power and responsibilities, and to promise them professional status and corresponding pay incentives.

The report proposed the creation of a National Board for Professional Teaching Standards, organized with a regional and state membership structure, to establish high standards for what teachers need to know and to be able to do and to certify teachers who meet these standards. The national board should include governors, chief state school officers, school administrators, and classroom teachers. The task force hoped that individual states would require board certification and state licensing. This would symbolize the strength of the profession, all on a strictly voluntary-compliance basis.

The report recommended that a bachelor's degree in the arts and sciences be a prerequisite for professional study of teaching. It recommended a new professional curriculum in graduate schools of education leading to a Master in Teaching degree, based on systematic knowledge of teaching and including internships and residencies in schools. Recommendations were also made to restructure the teaching force and to introduce a new category of leading teachers with proven ability to provide active leadership in redesigning schools and helping colleagues uphold high standards of learning and teaching.

Like A Nation at Risk, it presented a pessimistic view of national economic well-being in the future unless the education process were improved. To assure economic well-being, far more demanding educational standards were to be achieved than had been attempted before. To accomplish this goal, a teaching profession equal to the task was to be created (Sikula 1990, pp.78-79).

The Holmes Group is a consortium of education deans and chief academic officers from the major research universities in each of the fifty states. The report "Tomorrow's Teachers" is a proposal from 23 education deans interested in alternative ways of involving major research universities in improving the quality of teacher education.

In the report five goals were developed:

1. to make the education of teachers intellectually more solid,
2. to recognize differences in teachers' knowledge, skill, and commitment, in their education, certification, and work,
3. to create standards of entry to the profession (examinations and educational requirements) that were professionally relevant and intellectually defensible,
4. to connect institutions of higher education to schools,
5. to make schools better places for teachers to work and to learn (Holmes Group 1986, pp. 4).

The report called for extended programs of teacher education wherein the professional education of teachers would take place in a 2-year, postgraduate, master's degree program following a 4-year baccalaureate. It recommended three tiers of teachers: **instructors**, who would be baccalaureate graduates without professional preparation, permitted to teach under supervision for less than 5 years if they had a sound general education, a strong major or minor in the teaching field, and the basics of pedagogy; **professionals**, who would have completed the full 6-year program and be recommended for certification; and **career professionals**, who would engage in study beyond the master's degree and be responsible for the supervision of graduate instruction, so that potential teachers could study subjects they would teach with exemplary instructors who understood the pedagogy of their subjects. The report recommended more in-depth study of subjects taught by prospective elementary teachers and more study of pedagogy by prospective secondary teachers.

The Holmes Group proposed stronger evaluation of teacher candidates for entry, retention, and licensing. It suggested establishment of professional development schools analogous to teaching hospitals. The report called for focus on the use of the knowledge base supporting teaching practice and more extensive research on teaching, teacher education, and the learning of academic subjects. It noted the need to increase the number and quality of minority candidates in teacher education.

Ninety members joined the Holmes Group in the fall of 1986. Institutions committed themselves to major research and development initiatives, paying $4,000 annually for membership. Meetings were held in several regions of the country, and annual national conferences were conducted to exchange ideas, reformulate programs, and extend understanding (Sikula 1990, pp.78-79).

2.2.1.1. REFLECTIONS ON THE RECOMMENDATIONS OF THE NATIONAL COMMISSION REPORTS

The proposals in the National Commission Reports have faced both praise and criticism concerning their recommendations to improve education. One advantage that the Holmes Group seems to have is that its proposals have emerged from those actually involved in the process of teacher education. The commitment to implementation comes from those who developed the plans. On the other hand, the reformers of the Holmes Group represent only a small segment of the teacher training community in the United States, and there are many interests, philosophies, and orientations at stake (Altbach 1987).

The Holmes Group proposals can be seen as having a strong political dimension. The proposals are an attempt by the research-oriented universities to assert their primacy in teacher education by rewriting their role and certification structure so that this structure better conforms to the way these institutions operate (Tom 1987).

The Holmes Group report only partly recognizes the fact that extending teacher training beyond the fourth year could present problems for some individuals. Extending professional training longer than four years will have elitist effects unless large sums of money are made available in outright grants for living expenses, books, and so on. Without these incentives the recommendations will make it more difficult for less economically advantaged individuals to become teachers. Without such extensive financial support, movements to increase the amount of time spent in teacher education should be resisted, since their class and race stratifying effects could be massive (Apple 1987).

Many scholars have criticized the report's career-ladder recommendation. The hierarchical structure of the teaching profession might hinder collegiality and collaboration among the teachers. The primary role of the Career Professionals is not clear. The Holmes report does not specify the technical aspects of the relationships between the Career Professionals and the other teaching force. One does not have to create three levels in order to provide an internship for trainee teachers or to give teachers more of a leadership role and greater involvement in policy (Conley & Bacharach 1987).

The differentiated staffing patterns might have major economic implications. Many school systems can attempt to minimize costs by hiring as many instructors as possible. These short-term, non-tenured appointments would save districts a good deal of money. Economical reasons would limit the number of Career Professionals and Professional Teachers which would make it impossible for everybody to advance in their career. Some critics, for example (Conley & Bacharach 1987), have suggested that the Holmes Group could have advocated an adequately financed system of career-long continuing education for all practitioners.

On the national level, the report may be used to justify mass testing of teachers of a very inflexible kind. This tendency might lead to more competency-based teaching and teacher education. The reports apply a medical paradigm to teaching, which easily leads to narrowly defined methods and techniques. This kind of approach to teaching can actually depower, not empower the teachers (Soltis 1987).

State control over education has increased since the beginning of the reform movement. For example, states are strengthening high school graduation requirements, establishing criteria for admission to teacher education programs and requiring pre-licensing tests. Many states have taken actions to improve their teacher education programs. For example in the state of Indiana six universities formed a group to make an effort to improve teacher education. This Coalition of Teacher Education Programs (COTEP) was a voluntary group drawn together by a concern over the coming shortage of qualified teachers and the tarnished image of the teaching profession. Since the six universities prepare over 80 percent of Indiana's supply of new teachers, the deans believed that a joint effort could make a substantial difference in the quality of the Indiana teaching force (COTEP 1986, pp.2-3).

The COTEP institutions rejected the recommendation in the National Reports to abandon undergraduate teacher education and to move it to the graduate level. The reasons for rejecting this recommendation in Indiana is discussed in detail in the COTEP report (1986, pp.93-97). The COTEP members agreed with the recommendations calling for cohort group admission, higher admission standards, academic minors for elementary majors, and support during the induction year.

A major goal of the teacher education programs at COTEP institutions should be to develop teachers who are thoughtful about their teaching and who make decisions on that basis (COTEP 1986).

2.2.2. A REFLECTIVE TEACHER AS A GOAL IN TEACHER EDUCATION

During the previous decade one of the most widely accepted goals for teacher education has been a reflective teacher. "Reflective teaching" has become a slogan that almost all teacher educators use in describing their teacher training programs (Zeichner & Tabachnick 1991). Terms such as "reflective practice", "inquiry-oriented teacher education", "reflection-in-action", "teacher as researcher", "teacher as decision-maker", "teacher as professional", "teacher as problem-solver", are all associated with reflection but have different conceptual variations and implications in teaching and teacher education (Calderhead 1989, pp.43).

The term "reflective teaching" originates from the work of Dewey who made a distinction between reflective and routine action. He defined reflection as "an integration of attitudes and skills in the methods of inquiry, with the attitudes of open-mindness, responsibility, and wholeheartedness" (Dewey 1933). Schon (1983, 1987, 1989) derived his concepts in part from Dewey's notion of reflection and brought new concepts such as "reflection in action" and "reflection on action" into the teacher education community. Reflection in action refers to the thinking that goes on in the midst of action. Teachers are framing and reframing problems as they work on it, testing out their interpretations and solutions, thus combining both reflection and action. Reflection on action refers to thinking that occurs in retrospect about a problematic situation and about one's reflections-in-action about that situation.

The relationship between either Dewey's or Schon's concept of reflection and teacher education is not clear. Aiming at reflective teachers does not translate directly into the content of a teacher education program. Neither Dewey nor Schon tell us what it is that teachers ought to be reflecting about (Richardson 1990). There is a danger that the reflection itself becomes the goal of teacher education program and what the teachers reflect on can become of secondary value. The slogan "reflective teaching" conceals different motives and ideologies. It is very important to analyze different proposals for reflective teaching and identify clearly the educational and political commitments that stand behind them (Zeichner & Tabachnich 1991).

Attempts have been made to clarify the conceptual distinctions among reflective teacher education projects (Tom 1985, Grimmett et al 1990, Valli 1990, Leino 1992). Zeichner and Liston (1990) have identified four varieties of reflective teaching practice based on their analysis of reform traditions in twentieth-century US teacher education. In the next chapter this analysis of reform traditions is used as a framework to review different trends in American and Finnish teacher education. In the same context the different reflective practices are discussed with focus on the notion of the ideal teacher as a goal of development.

Chapter 3

THE REFORM TRADITIONS

Several different analyses of alternative conceptual orientations to teacher education have recently appeared in the professional literature (for example Zeichner 1983, Doyle 1990, Feiman-Nemser 1990). Feiman-Nemser (1990) has compared these recent typologies and identified six for her review. She found considerable overlap in the theoretical perspectives, models, and paradigms discussed. They all included something resembling the critical, technological, and practical schools of thought; three acknowledged a personal tradition and two revealed an academic orientation (Feiman-Nemser 1990, pp.220-221).

One of the most quoted conceptualizations of the different orientations in teacher education has been Zeichner's four paradigm concept (Zeichner 1983). In his recent work he has based his classification on these paradigms and outlined four distinct traditions of reform in twentieth-century U.S. teacher education. These reform traditions are:

- The Academic tradition,
- The Social-efficiency tradition,
- The Developmentalist tradition,
- The Social-reconstructionist tradition.

Zeichner argues that none of the contemporary proposals for the reform of teacher education can be understood exclusively in relation to any one tradition. The framework of reform traditions has been presented to enable us to situate different proposals in relation to others and to be able to link specific proposals to the broader schools of thought and sets of commitments from which they draw (Liston & Zeichner 1991, pp.4-5).

We will now look more closely out to these four reform traditions in the context of teachers' professional development and discuss what type of a teacher they see as the goal of the development. In the same context we will discuss how these orientations have affected Finnish teacher education.

3.1. A PEDAGOGICALLY THINKING TEACHER AS A GOAL: THE ACADEMIC TRADITION

The academic orientation in teacher education emphasizes the teacher's role as a scholar and subject specialist. According to this view the most important task for teacher education is to give the students a broad knowledge in the liberal arts and the sciences. Traditionally the academic tradition of reform in teacher education has had the most impact on the preparation of secondary teachers.

In the United States one of the problems facing teacher education has been its academically low status. There is evidence that those who enter teacher education generally score lower on tests of academic achievement than those who enter other career tracks. The number of academically talented persons in teaching and teacher education has remained low. Many teachers and teacher educators come from home and family backgrounds whose academic roots are often shallow and which therefore are not likely to independently develop strong academic orientation. Persons with low measures of academic talent are allowed to dominate the field. As a result, teacher education tends to be easy and nonintellectual (Lanier & Little 1986, pp.565).

Teachers' subject knowledge has recently been under conceptual and empirical investigation. The research was stimulated in part by Shulman's (1986) argument that the teachers need to possess subject knowledge that differs from the knowledge of experts on the subject matter, because teachers are most concerned with the need to help others understand particular content. Teachers need knowledge of the subject which is supplemented with knowledge of students and learning, and with knowledge of curriculum and school context. This blend of content and pedagogy is labeled as pedagogigal content knowledge.

A large-scale study at the National Center for Research on Teacher learning known as the Teacher Education and Learning to Teach (TELT) included more than 700 teachers and teacher candidates. The particular interest of the study was what teachers learned about teaching and learning from their different teacher education programs. The participants in the study were asked to use their subject matter knowledge as a teacher would in answering the questions. For instance, they were asked to develop a story problem that would illustrate a particular mathematical proposition, or to explain a particular concept to a confused 6th or 10th grader. These tasks did not require factual recall, but instead required respondents to explain basic ideas or to reason about an issue. They had to generate the entire answer on their own without any given categories.

One of the most surprising findings from the TELT-study was that the teachers who majored in a subject were often no more able to explain fundamental concepts in their discipline than the teachers who had not majored in that subject (Kennedy 1991, pp.14-17). This study result can be explained by the fact that teachers need an understanding of subject matter that is more explicit and deeper than the subject matter needed by other practitioners, for instance. Teachers need not only to understand the content deeply, but also to know something about how that content is taught and learned. In the other words, the teachers need pedagogical content knowledge. Grossman (1991) describes teachers as mediators between the world of the discipline and the world of students. In order to help students learn, teachers must rethink their subjects from the perspective of students.

In Finland the teacher education is very academic in nature. The applicants for teacher education programs are academically very well performed students. This is in contrast to the situation in the United States where the level of students enrolling to major in education is going down alarmingly according to the SAT scores (Halmela & Komulainen 1983, pp.18-19).

In 1974 all teacher education in Finland was incorporated into universities. This reform created ten university-level departments where (among others) teachers for the lower level of the comprehensive schools were trained. Starting from 1979 all the graduates from teacher education received the Candidate's degree, which corresponds to the Masters' of Arts (including the M.A. thesis) degree in the American system.

The Finnish committee on the development of teacher training has evaluated the current training of Finnish class and subject teachers[1] and viewed the training as very academic :

> "The current training of class teachers has been successful in many ways. Training is both popular and very highly regarded. Compared to the figures in international statistics and investigations of teacher training, the number of applicants to the training colleges for class

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[1] In Finland the term "class teacher" refers to an elementary teacher, and "subject teacher" usually denotes a secondary teacher.

teachers in Finland is exceptionally high. Colleges are able to select students from a large number of very talented and highly motivated applicants. Although, there still are problems in satisfactorily integrating scientific and professional studies, colleges are in favor of an academic degree as the basis of the training of teachers. Many colleges have made an important contribution to the implementation of an academic training, notwithstanding often all but adequate financial resources. In gross, the colleges have succeeded very well in their tasks. The median time spent towards a master's degree in pedagogics is 4.8 years. This is a short time compared to the median for obtaining a degree at other institutions of higher education. On the average drop-outs or change of majoring subjects are comparatively fewer in the field of pedagogics than in other fields of education. Preliminary research findings also indicate that teacher students generally value the studies preceding the writing of their master's thesis. When the thesis has been closely linked to school life and teaching, it has been assessed profitable in terms both of developing one's own way of thinking and of carrying on the job as a teacher." (Anon. 1989, pp.110-111)

The concept of pedagogical content knowledge (Shulman 1986), which has recently been widely approved and discussed in United States, has been acknowledged much earlier in Finnish teacher education. In Finland the students in teacher education programs study subject-related pedagogics: the fields of mother-tongue pedagogics, foreign language pedagogics, pedagogics of mathematical subjects, pedagogics of biology and geography, etc. The teacher education departments have positions for professorships in pedagogics of different subject-areas who formulate the goals and aims of their fields of study and follow and lead research within it (Hellgren 1992). The Finnish education departments have also junior and senior lecturers who teach the prospective teachers. These lecturers have competence in both pedagogics and their own subject-area.

In Finland the goal of teacher education is to develop academic professionals who are capable of scientific thinking (for example: Kansanen 1989, Hellgren 1992). This emphasis is so widely agreed that we can view the academic reform tradition as one of the main influences in Finnish teacher education today.

The academic version of reflective teaching stresses reflection upon subject matter and the representation and translation of subject knowledge to promote student understanding. Shulman (1986, 1987) and Buchmann (1984) are advocates of this version of reflective teaching emphasizing the teacher's deliberations about subject matter and its transformation to pupils to promote understanding (Zeichner & Tabachnick 1991).

In Finland the purpose of the theoretical studies with the Master's thesis in teacher education is to encourage pedagogical thinking. The teachers need to make decisions all the time in the classroom and in teacher education they are guided to base their decisions on educational aims and goals. A strong knowledge base in pedagogy and other relevant academic subjects helps teachers in their decision-making process to base their decisions on pedagogical theories (Kansanen 1991).

3.2. AN AUTONOMOUS TEACHER AS A GOAL: THE DEVELOPMENTALIST TRADITION

The developmentalist tradition of reform in teacher education has its roots in the child study movement initiated by G. Stanley Hall and others near the turn of the century. According to this tradition the natural order of the development of the learner provides the basis for determining what should be taught, both to pupils in the public schools and to their teachers. The advocates of this tradition want to educate creative and imaginative teachers who have a clear understanding of the developmentalist philosophy and children's patterns of growth and development (Liston & Zeichner 1991, pp.20-21).

One of the trends in the developmentalist reform tradition is humanistic teacher education. The personality-oriented teacher education identified earlier by Zeichner is based on humanistic psychology (Zeichner 1983, pp.4). In humanistic teacher education the ideal teacher is seen as a harmonious personality (Combs et al. 1974). Humanistic teacher education emphasizes the free will of a student teacher ; i.e., "people do what they please". No single teaching skill or subject matter is seen as necessary for effective teaching. The teacher is believed to grow better in his profession if he is allowed to make important decisions about his learning already during the teacher training. The aim of the humanistic teacher education is to develop the personality of a student teacher and support his image of himself as a teacher (Combs et al 1974). Central to personality-oriented teacher education is promoting the psychological maturity of prospective teachers (Zeichner 1983, pp.4).

The self-directed teacher in humanistic psychology resembles closely the "innovator-teacher" developed in Finland by Koskenniemi (1978, pp.223-226). An innovator-teacher is not constrained by general didactic rules because he is able to develop his own personal situation-dependent strategies for himself, for different individuals and groups, and for different teaching situations. An innovator-teacher is able to analyze teaching situations and to make decisions based on them and to evaluate the effects of his own behavior on the teaching situation. Koskenniemi identifies the desire for continuous personal growth in the profession as an important characteristic of an innovator-teacher.

The program of class teacher education in Helsinki is based on the ideology of humanistic psychology (Hytönen 1982, pp.21-22). The goal of this teacher education is an innovator-teacher who can analyze teaching situations with the help of scientific thinking (Hytönen 1982, Hytönen 1989, pp.115). Hytönen finds the current education goal based on humanistic psychology too individually centered, and an innovator-teacher as an ideal teacher to be too narrow in scope (1989, pp.115-117).

Teacher education needs a wider base for a theory where the social, philosophical and historical aspects of education are seen together with the didactic view. The current school system needs teachers who can critically reflect the school as a part of the society, and who actively participate in the development of a more democratic society (Hytönen 1989). In this respect Hytönen joins the reform tradition of social-reconstructionism discussed in Section 3.3.

In the personality-oriented approach the teacher is seen as an active agent who is able to affect the content and the direction of his professional growth (Zeichner 1983, pp.5). In this orientation teacher education is implemented in an educational and social context, which is accepted as given. This education ignores the effects upon social systems and concentrates on the growth of an individual. The political and ethical values that effect the teaching are neither the central concern of this orientation, nor the social context of teaching.

Zeichner has identified reflective practice as one of the two major traditions of practicum reform in teacher education. According to this practicum the "knowledge base" of teaching and teacher education exists in part in the actions of exemplary practitioners. Teaching is viewed as a form of research and experimentation and teachers' practical theories are accorded a legitimacy which they are denied in the dominant applied science view (Zeichner 1990). The key contributors of this practicum are Donald Schon and Zeichner himself. Schon has provided us with a set of concepts for describing this "knowing-in-action" (Schon 1987), and Zeichner has adapted the concept of reflective teaching in the teacher education program at the University of Wisconsin-Madison (Zeichner & Liston 1987).

One of the central metaphors associated with earlier manifestations of developmentalist tradition in teacher education is the teacher as artist (Liston & Zeichner 1991, pp. 22). Today perhaps the most articulate scholar who views teaching as an art and the teacher as an artist in the classroom is Elliot Eisner. In his article "Art and craft of teaching" he describes the differences between art and craft: "What is it that distinguishes the art of teaching from the craft of teaching? It is precisely the willingness and ability to create new forms of teaching - new teaching moves - moves that were not a part of one's existing repertoire. The craftsperson in the classroom has the repertoire, is skilled in its use, and manages the performance quite well indeed. But the craftsperson creates essentially nothing new as a performer. This person's mark is known by the skill with which he or she uses known routines. The artist in the classroom invents new ones in the process. Such modes of performance are not plentiful, and they require ingenuity and all of the skill that the person possesses. The artist is rarer than the craftsperson. The aesthetic in teaching is the experience secured from being able to put your own signature on your own work - to look at it and say it was good." (Eisner 1984)

A developmentalist version of reflective teaching prioritizes teaching that is sensitive to students' interests, thinking and patterns of developmental growth (Zeichner & Tabachnick 1991, pp.6-7). An example of this version of reflective practice is the work of Duckworth at Harvard University (Duckworth 1987). In her reflective teaching the learners are engaged with phenomena they are studying and the teachers are trying to understand the sense the learners are making of those phenomena. The most important job for the teacher is to keep trying to find out what sense the students are making. The focus on reflection in this version is clearly on students (Zeichner & Tabachnick 1991).

3.3. A SOCIALLY ACTIVE TEACHER AS A GOAL: THE SOCIAL-RECONSTRUCTIONIST TRADITION

3.3.1. A POLITICALLY ACTIVE TEACHER AS A GOAL: CRITICAL PEDAGOGY

The Social-reconstructionist reform tradition in teacher education defines both schooling and teacher education as crucial elements in a movement toward a more just society. If teachers were to fulfill their role in social reconstruction teacher education itself would have to be reconstructed. Zeichner argues that this orientation has a marginal status in relation to teacher education programs in the U.S. There is a general lack of existing programs in teacher education committed to this reform tradition (Liston & Zeichner 1991, pp.26-36).

The main characteristic of social-reconstructionist teacher education programs is the acknowledgment of the fundamentally political character of teaching and teacher education. In the courses and in supervision of field experiences the emphasis should be on issues and practices that bring the factors of injustice and inequity into focus for scrutiny. These issues include highlighting gender, class, race, and other differences in relation to curriculum, instruction, and the school structure and organization. Social-reconstructionist teacher educators will need to become more involved than most are now in the political arena of teacher education where they could support efforts to democratize schools and to support progressive political movements (Liston & Zeichner 1991).

Other proponents of a social-reconstructionist tradition include Shor (1986), Giroux and McLaren (1987). These authors have criticized the national reports of the 1980s (especially "A Nation at Risk and A Nation Prepared: Teachers for the 21st century") for their ignorance in addressing the ideological, social, and economic conditions underlying poor teacher and student performance. Giroux and McLaren advocate "critical pedagogy" which focuses on self-empowerment and social transformation. The central concern of the critical pedagogists is to develop a view of teacher education that defines teachers as transformative intellectuals and schooling as part of an ongoing struggle for democracy (Giroux & McLaren 1987, pp.160).

Zeichner himself is a strong advocate of this tradition and his ideas are reflected in an inquiry-oriented student teaching program at the University of

Wisconsin in Madison. Although the program emphasizes reflective teaching, which is widely employed by many different teacher education programs, the term has a very conscious social and political orientation. This same "social" emphasis is the heart of the social-reconstructionist reform tradition (Liston & Zeichner 1991).

3.3.2. A RESEARCHING TEACHER AS A GOAL: INQUIRY-ORIENTED TEACHER EDUCATION

This orientation in teacher education prioritizes the development of inquiry about teaching and about the contexts in which teaching is carried out (Zeichner 1983, pp. 5). The technical skills in teaching are seen as necessary, but not sufficient conditions of good teaching. Questions about what ought to be done take primary importance in this orientation. Tom (1985) sees Zeichner as an advocate of the inquiry-oriented teacher education representing an approach emphasizing teaching and teacher education as an influence on the whole society.

In his inquiry-oriented teacher education program emphasizing critical inquiry, Zeichner wants to educate teachers who are able to analyze their own teaching. An important part of this analysis is the teacher's ability to examine the purpose and the goals of his own teaching. In that respect Zeichner sees a reflective teacher as an ideal teacher. The teacher is reflective when he has an open-minded and responsible attitude to his teaching and enough skills to analyze his teaching (Zeichner & Liston 1987).

As previously mentioned (see Section 3.3.1.) Zeichner always views teaching in the context of culture and the social reality. The reflective teacher has the ability to analyze existing ideological and political values and question them (Zeichner 1987). The teacher has to acknowledge his own values and to see their effects on his teaching and students.

Similarly, Tom (1984) emphasizes the ethical character of teaching and is an advocate of inquiry-oriented teacher education too (Tom 1985). According to Tom the teacher has a big responsibility for students' intellectual and social development. The teacher selects certain objectives and goals for his students. These selective processes reflect the concept of a desirable end. The teacher's own values and attitudes can affect the values and attitudes his students adopt. The relationship between a teacher and a student is inherently ethical because the teacher has power over his students, and can control the learning situation (Tom 1984, pp.78-90).

In inquiry-oriented training the teacher is viewed as an active agent who has opportunities to develop the whole society through his teaching. The goal of the teacher's professional development is an autonomous teacher who is constantly investigating and developing his own profession.

In Finland most of the teacher trainees view this autonomous, reflective teacher as a goal in a teacher's professional growth (Ojanen 1989a). In emphasizing the reflective approach to teaching, they view teacher education in the same kind of framework as the advocates in the American inquiry-oriented approach. There are variations in inquiry-oriented teacher education. All the advocates of this approach agree that in the process of viewing the teaching situation as a research problem is central to the process of inquiry, differences exist in identifying which areas are seen as most problematic among the various approaches. The advocates of narrow scope areas see the teaching learning process or the teacher's subject matter knowledge as problematic, and the advocates of the broad scope areas find the whole context of teaching problematic, including the ethical and political principles underlying the teaching (Tom 1985).

Hytönen wants to build a broader theory base to teacher education, and he emphasizes the teacher's ability in active and critical reflection on the school system and the whole of society. He sees an ideal teacher as one who is capable of thinking autonomious and developing both school and society more democratically (Hytönen 1989). Niemi (1988, 1989) views teaching as a moral craft similarly to Tom, and sets the goal for teacher education to develop teachers who can reflect their own teaching (Niemi 1989, pp.79). Kohonen has developed a model for teachers inservice training which is inquiry-oriented and based on Kolb's learning theory. He sees the goal of teachers' inservice training as being to establish and support reflective thinking in teachers (Kohonen 1989).

According to the advocates of the inquiry-oriented approach in Finland student teaching and its supervision needs to be developed in the direction of democratic discussion where the student teacher has a chance to reflect on the teaching situation and his own teaching (Hytönen 1989, Ojanen 1989b, Huttunen 1989). The supervision of student teaching needs to be shifted towards counseling that supports the professional development process of a student teacher, and such supervision should be seen as a mutual learning situation (Ojanen 1989b, pp.234).

It has been suggested that the grading of the students' teaching skills should be abandoned because it only decreases the democracy between a student teacher and a supervisor and prevents the student teacher from developing into an independent, responsible subject of his own teaching (Ojanen 1989b).

The committee on the development of student teaching (Anon. 1989) has made proposals according to the inquiry-oriented tradition for the training of teachers in the 1990's. The committee has set five long-range goals for developing teacher training (ibid.52-56):

1. a broad professional competence
2. flexible mobility within the system and flexible possibilities for continued studies
3. support of the development of teachers professionally and a higher appreciation of the teaching profession
4. interaction between the school, working life and teacher training
5. preparedness for international cooperation

These aims should be supported with high level scientific training which is professionally versatile. Teacher students should be guided to be able independently and in cooperation with others, to develop their work and the teaching profession (ibid.71).

Practical teacher training should be aimed to give an over-all picture of the teaching profession. The supervision of student teaching should implement the principles of work counseling and encourage the students to try new teaching strategies based on their pedagogic studies. Practical teaching training should include a lot of problem-centered reflection to deepen the pedagogic thinking of the students. These changes can be achieved by abandoning the grading of student teaching (ibid.64-65).

The social-reconstructionist version of reflective teaching stresses reflection about the social and political context of schooling and the assessment of classroom actions for their ability to contribute toward greater equity, social justice and humane conditions in schooling and society. Recognizing the fundamentally political character of all schooling, the teacher's reflections center upon issues such as the gendered nature of schooling and of teachers' work, the relationships between race and social class on the one hand and access to school knowledge and school achievement on the other. This version of reflective teaching is committed to reflection as a communal activity. The aim is to create "communities of learning" where teachers can support each others' growth (Zeichner & Tabachnick 1991, pp.7-9). The social-reconstructionist version of reflective teaching is a kind of reflection as reconstructing experience where knowledge is used to help teachers apprehend and transform practice (Grimmett et al. 1990).

3.4. AN EFFECTIVE TEACHER AS A GOAL: THE SOCIAL-EFFICIENCY TRADITION

The social-efficiency tradition in teacher education reform attempts to build a scientific base for the study of teaching. This knowledge base would provide the basis for building a teacher education curriculum. This reform tradition has much of the same content as the behavioristic paradigm in teacher education identified earlier by Zeichner (1983). Both these movements, whose goal is to produce effective teachers, draw from the teacher effectiveness research.

In the United States the teacher effectiveness approach has long dominated teacher education. The emergency of C/PBTE (competence/ performance based teacher education) in the 1960s was an influential manifestation of this perspective. CBTE presents a clear prototype of an effective teacher: the teacher's goal is to become the most effective teacher possible. Effective teaching is usually identified as teaching which causes most learning in the students (Dunkin & Biddle 1974, pp.13-14).

Teacher effectiveness research is based on an assumption that there is a direct relation between teaching behavior and student learning, and that this link represents a one-way flow of influence from teacher to student. The possibility that students may have an influence on a teacher's behavior is ignored. A student's role is considered to be passive and the studies have concentrated on identifying the behaviors of an effective teacher (Medley & Mitzel 1963, pp.258).

The critics of this tradition argue that learning is seen from the behavioristic point of view as a simple stimulus-response event. Researchers have applied the process-product paradigm to identify the characteristics of effective teaching. The research has been experimental in nature and focused on observation of classroom teaching. According to the positivistic research tradition, teaching is seen as a natural phenomenon whose stability makes it possible to identify the enduring regularities, whose "givenness" justifies removing the human purposes underlying teaching behavior from educational inquiry. With careful measurement and analysis the researchers have hoped to find causal laws that would help to predict teachers' behavior.

In his recent paper Zeichner contrasts two major traditions of practicum reform in the United States. They are the research-based practicum where teaching is seen as an applied science and the research-based practicum where teaching is seen as reflective practice (Zeichner 1990). The applied science view of teaching practice is based on a belief that educational research provides us with the basis for planning a teacher education curriculum, including a practicum curriculum. The key contributors to this position are Gage and Berliner. In his book "The Scientific Basis of the Art of Teaching" (Gage 1978) Gage argues that there is a scientifically based knowledge about methods of teaching. According to Gage students should learn about the techniques of teaching whose efficacy has strong empirical support. Teachers need to have teaching methods as well as subject matter knowledge. "That is, (a) teacher education should be aimed at producing (b) the kinds of teacher behaviors that have been shown to be related-preferably causally related-to (c) valued kinds of student knowledge, understanding, sensibility, and attitude" (Gage 1978, pp.58-59).

Gage argues that research on classroom management has already produced results well worth the cost of including them in the teacher education curriculum. His view of teaching combines the instruction in empirically based skills and teaching that includes flexibility, judgment, and intuition. Gage is an advocate of the broad version of the applied science perspective. In the broad version teachers would use the research as principles of procedure within a broader process of decision-making and problem-solving. As he states in his book "statistical results can help a teacher know the averages or trends around which individual cases will vary, and such knowledge can aid in understanding the individual" (Gage 1985, pp.4-5).

According to Gage research results can be seen as helpful starting points, not prescriptions to be followed in all circumstances.

In this study we join the broad version of applied science perspective. The self-evaluation instrument discussed in Chapter 5 is meant to be seen as a helpful starting point in the teacher's reflection on his own classroom behavior, not as a full prescription to be followed. The knowledge of teaching effective research and its findings should be one of the resources a reflective teacher uses (with critical mind) in guiding his own professional development.

Zeichner identifies David Berliner as currently the most articulate spokesperson for the applied science position in the USA (Zeichner 1990). Berliner has argued that for the first time teacher education has a scientific foundation (Berliner 1984, pp.94). He thinks it is time to restructure teacher education programs including the practicum to provide for more systematic training in the knowledge, skills, and decision-making strategies that research has identified as being associated with desirable school outcomes. Berliner has called for the creation of pedagogical laboratories that provide experimental conditions for student teachers to try out the behaviors and teaching strategies to be learned (Berliner 1985).

Behavioristic, technical orientation in teacher education represents the trend in which the goal is to become as effective a teacher as possible, and to master certain technical teaching skills. The critics argue that in this kind of teacher education a teacher is viewed as a passive recipient of knowledge who is not able to direct his own professional development. The educational and social context of the teacher education is also accepted as given. Teacher education based on behavioristic orientation does not support the teacher's growth towards self-direction and autonomous decision making. Neither does the training recognize the ethical and social aspects of teaching as central in teacher education (Zeichner 1983, pp.3-7).

Features of this teacher effectiveness trend can be found in Finnish teacher education (Puurula 1983). In the teacher training the student teachers are expected to master certain teaching skills. These skills are based on S.C.T. Clarke's general teaching theory (Clarke 1970), reported in Finland by Renko (1971). Several scholars have studied it's usefulness in Finland (for example Lahdes et al. 1975, Vierula 1982, Vähätalo 1984). Clarke's theory is widely used in assessment of student teachers in teacher training institutes.

Clarke's theory argues that learning theory is a necessary but not sufficient condition for teaching theory, and it is possible to formulate a general theory where subtheories can be added (Clarke 1970). Clarke's theory is prescriptive and identifies the most important skills in teaching. Clarke arranges the skills into three different levels which interact with each other. The skills are presented as prescriptive statements which describe the content of teaching or the expected teaching results. The theory has eight main statements.

In Finland Lahdes has applied Clarke's theory to the measurement of teaching skills (Lahdes 1972). He converted Clarke's statements into behavioral objectives that define concrete teaching skills. Lahdes then added a number of statements concerning the mastery of the subject to be taught, planning, and corrective instruction. A survey was conducted to investigate the attitudes of Finnish teacher trainers towards Clarke's theory (Lahdes et al. 1975). The teacher trainers found all of the component skills to be relatively important and appropriate for assessing the teaching skills among the student teachers. The statements evaluated by the teacher trainers (N=51) were analyzed statistically and combined into eight categories on three levels. These levels were similar to the original levels of the Clarke model. We will briefly describe the Lahdes model levels.

The 3rd level includes:

8. Flexibility in evaluation procedures and teaching arrangements,
7. Long-term curricular planning ability.

The 2nd level includes:

6. Mastering working methods, adaptation, and individualization of teaching

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The 1st level includes:

5. Skills of motivation and activation,
4. An ability to create social organization,
3. Maintenance of personal relationships,
2. Communication skills,
1. Mastering the subject to be taught.

Figure 2.2. Systematization of teaching skills. Adapted from (Lahdes 1983).

The basic, first-level skills are not strictly speaking teaching skills, but a collection of certain minimum standard requirements to be met in order to allow the second level teaching skills to function. The two lower levels form a basis for the highest level, the level of efficient, flexible and creative teaching. These levels form a hierarchy parallel to Bloom's cognitive taxonomy (Lahdes 1974).

The third level skills require a broad perspective from the teacher, and can be compared to the operations of "analyzing", "synthesizing" and "evaluation" in the taxonomy. The second level skills operate at the same level as "implementing" in the cognitive taxonomy, and the basic skills at the first level are the necessary conditions of teaching, and correspond to the level of "remembering and understanding" in the cognitive taxonomy (Lahdes 1974).

Clarke's teaching theory has some behavioristic features. Its goal is to attain good learning results from a teacher's effective teaching. Clarke's statements are based on empirical, behavioristic research results, and he is aiming at effective teaching similar to the American competence based teacher education (C/PBTE). Both Clarke's theory and CBTE share the attempt to define certain teaching skills as very concrete behaviors. On the other hand, when Clarke's theory has been applied in Finland the focus has been on discovery learning rather than on the strictly controlled behavioristic model (Anon. 1983).

Clarke's theory has been a useful tool in teacher training for the trainers both for supervising and evaluating the student teachers. It has provided a theoretical framework and the objectivity needed in all kinds of grading. Clarke's theory has been criticized for its lack of empirical support (Yrjönsuuri 1987, pp.17). In addition, in the modern context of teacher education Clarke's theory can be seen as very narrow in scope.

One should observe that in the current debates on teacher education reform the social-efficiency tradition has emerged again under the label of "research-based" teacher education. For example the proposals of the Holmes Group (1986) are very strongly influenced by this tradition. Throughout the century the common thread that ties the different approaches among this tradition together has been their reliance on the scientific study of teaching as the major source for determining the teacher education curriculum (Zeichner & Tabachnick 1991, pp.5-6).

The social-efficiency version of reflective teaching emphasizes the thoughtful application of particular teaching strategies that have been suggested by research on teaching. This version of reflective teaching falls into the conceptual orientation Grimmett et al. (1990) have identified mediation of action where knowledge is used to direct practice as instrumental. This orientation can be seen as a technical definition of reflection. Examples of these perspectives are the reflective inquiry teacher education program (RITE) at the University of Houston (Freiberg & Waxman 1990), the PROTEACH program at the University of Florida (Ross & Kyle 1987) and Cruickshank's reflective teaching program at Ohio State University (Cruickshank 1987).

Although the programs differ in many details they all have the same emphasis on the intelligent use of "generic" teaching skills and strategies that have been suggested by research (Zeichner & Tabachnick 1991, pp.5-6).

3.5. SOME OBSERVATIONS ON TEACHER EDUCATION DERIVING FROM DIFFERENT REFORM TRADITIONS

We view the behavioristic approach in teacher education as an orientation which sees an effective teacher as an ideal teacher. This orientation has been criticized as mechanical, and leading to imitation of given teaching models. The personality and the inquiry-oriented teacher education do not specify any necessary skills for a good teacher; hence we view these orientations as aiming to educate autonomous teachers.

According to Doyle there are several clear indicators that the disciplinary foundation for teachers and teacher education is shifting. This shift can be seen for example in the emphasis on understanding contexts and situations rather than simply individual behavior, and in the concern for examining domain-specific knowledge structures rather than general cognitive processes. Investigators have adopted theories and interpretive methods from a variety of disciplines-anthropology, linguistics, sociology and literary criticism to capture the richness and complexity of teaching practices, classroom life, and teachers' knowledge. In addition, attention has turned to curriculum and to the disciplines the teachers are teaching as an important knowledge source for practice (Doyle 1990 pp.19).

In Finland the trend in teacher education seems to be away from behavioristic orientation towards more academic and inquiry-oriented teacher education. An autonomous, reflective teacher has been set as a goal for teachers' professional development (Ojanen 1989a). We see some advantages in behavioristic orientation, if it is used in a proper way in teacher education. According to Pickle's model of teachers' professional development, a beginner teacher is often at a survival stage, and probably can't reflect on his teaching very much or frame autonomous goals for his own professional development. An autonomous, responsible teacher with a teaching philosophy of his own together with understanding of the ethical and political values underlying teaching is a very high standard demand. In real life not many novice teachers can satisfy those requirements.

At the beginning of teacher's professional development we should let the teacher concentrate on mastering the basic teaching skills, and the interaction process between the students and the teacher. With behavioristic orientation it is easier to operationalize the desirable teacher behaviors than for example in the personality and inquiry-oriented approach. In student teaching the student knows what is expected from him, and the feedback is easy to give when you can look at particular behaviors. Mastering the defined basic teaching behaviors can increase the student's self-esteem and make him feel more confident as a teacher. A positive attitude and a feeling of success are the best start for the teacher's growth.

An example from the expert teachers is an essential part of the developing process of a trainee teacher. We find it very important that student teachers see different kinds of teaching models and methods. Observation of others doesn't necessary lead to imitation of them. The student teachers can be guided to reflect the teaching models they have seen and critically evaluate their usefulness in applying them in their own teaching. The inquiry-oriented approach admits that certain teaching skills are necessary for successful teaching. At the beginning of a teacher's professional development it would be only natural to concentrate on these more concrete things. After being more comfortable in using different kinds of teaching methods, and the interaction between the students and the teacher is working the teacher is more capable of thinking about the values and the goals of his teaching. Similarly the teacher is able to analyze the teaching situation reflectively. If we ask too much too soon at the beginning of a teacher's professional development, we might only discourage the teacher and prevent his growth in the teaching profession.

An autonomous teacher is a worthwhile goal for teachers' professional development, and this goal should be presented right at the beginning of the teacher education program. Growth in the teaching profession doesn't happen instantaneously and the students mature at a different rate. There are always some individuals who are very mature immediately and ready to reflect on their teaching. Some individuals might never be able to reflect on their teaching and to become autonomous teachers. They might still be able to master certain basic teaching skills and be friendly, supportive teachers who understand the children. Not everybody advances to the highest level of thinking and to the highest level of professional development. We can't afford to lose those teachers who can't autonomously reflect on their teaching, but can master basic teaching skills and the interaction with students. Different teachers with different capacities are needed just as we have heterogeneous students in the schools.

If the teacher's development in the teaching profession is seen as a process with several phases the early phases can be seen as guided by behavioristic clearly defined behavior goals that are easy to master. After mastering certain basic teaching skills the teachers can concentrate on finding their personal teaching style. Observation of expert teachers and colleagues can aid in identifying those teaching behaviors that suit the personality of a individual teacher. When the personal teaching style is found, the teacher has more time and energy to ask the questions underlying the teaching, including the ethical and political values. These questions are not usually of primary importance for a beginner teacher because classroom management and the interaction with students are more concrete and evident behaviors.

The four main orientations in teacher education discussed above can be arranged in a hierarchy, and can be used in teacher education or teacher inservice training to meet the needs of teachers at different levels. The needs of beginner teachers and experienced teachers might be very different, and these groups need different kinds of guidance in their professional development. We don't necessarily view the effective teacher and the autonomous teacher as opposite to each other. We need teachers who can be effective and autonomous at the same time.

Zeichner views the isolation of different orientations as the most serious problem in teacher education today. Although he advocates the reflective practice orientation he does not dismiss the proposals and accomplishments of an applied science view. He argues that different reform paradigms should enrich another and the practicum curriculum of the future should begin to build bridges across diverse traditions of reform (Zeichner 1990).

Chapter 4

METHODS FOR HELPING TEACHERS' PROFESSIONAL GROWTH

Various types of remedies have been developed for teachers in order to help them to reach the goal of professional growth. Here we discuss the most promising and widely used methods in Finland. In addition we suggest some methods for the future, aiming at helping the teachers in developing in their profession.

4.1. SUPERVISION FOR TEACHERS

One of the most popular ways to support teachers' professional growth is through supervision. The knowledge and experience in teachers' supervision has increased in the 1980s, and case studies have shown positive effect on teachers' personal growth (for example, Ojanen 1985, Sava 1987). For the purposes of this study the supervision of teachers can be defined according to the Finnish committee of supervision:

> "Supervision of a teacher means that a more experienced teacher or somebody else specialized in school life supervises and supports the teacher in his work, its evaluation and in other problems concerning the work, handling those problems and finding solutions to them" (Anon. 1982, pp.33).

Sava (1987) has identified two different types of supervision in her study of the theory and the methods of supervision. They are direct and indirect supervision.

> "Direct supervision means a situation where the supervisor is present in the teaching situation where the supervisee needs support and supervision" (Sava 1987, pp.32).

A typical example of direct supervision is practical training in student teaching, where the trainers observe the teaching of the student and giving immediate feedback right after the class. In United States this type of supervision is very common because almost every school has hired supervisors for that purpose.

> "Indirect supervision is individual or group supervision, which takes place outside the "natural" working situation where the supervisee himself talks about his working situations, problems etc." (Sava 1987, pp.32).

In indirect supervision there is no objective information available concerning the teacher's behavior in the working situation. In Finland the most common practice is indirect supervision in a group. This is natural because there are not enough resources for individual supervision.

In her study Sava (1987) used indirect supervision. The supervisees were two groups of special education teachers (10 teachers/group), Sava supervised for one year. Supervision of these two groups was studied using observation by outsiders, and by the experiences of the people involved. In addition the changes in the teacher-self-images and teacher-ideal-images were examined during this supervision year. The supervision was aimed at increasing both the self-understanding and understanding of human interaction processes among the teachers. The goal was to help the teachers to acknowledge their own image of themselves as a teacher, and to think about the ideal teacher they would like to become. The purpose of the supervision was to help the teachers get closer to their teacher-ideal-images.

The indirect supervision that Sava used supported the growth of teachers' personality by increasing their self-understanding. In a teacher's work his personality is the central tool for educating children, and self-understanding can be seen as a necessary element in the teacher's professional growth. According to Sava the teachers being supervised required supervision which would focus on handling the problems in his work, and concrete suggestions for methods to use (Sava 1987, pp.165).

Sava sees a need for direct supervision in the working places in addition to indirect supervision. This direct supervision could be implemented by using for example collegial supervision. One important area for teacher inservice training is to prepare teachers for this kind of direct supervision (Sava 1987, pp.165).

A Finnish teacher is reluctant to let any outsiders to observe his classroom teaching. In principle it is possible that after the student teaching, the Finnish teacher gets no feedback from his classroom behavior during his whole career. The possible feedback sources are the principal of the school who should now and then observe the teaching in his school, and the visits of an inspector during school inspections. In practice these situations are very rare in an average school. The inspections are made every 3-5 years and they are more like general school inspections than evaluating and analyzing the teacher's classroom behaviors (Lyytinen 1987, pp.3-4). The feedback from the principal depends very much on the principal's interests in educational issues.

In the future it would be very important for the teacher's professional development to get some direct supervision after the student teaching. Direct supervision could be part of teachers' inservice training and it should operate on a voluntary basis. If the teaching profession is seen as a career which requires continuous growth in the field, regular feedback should be an essential part of it.

4.2. INSERVICE TRAINING FOR TEACHERS

Inservice training or inservice education for teachers is rooted in the belief that all teachers can improve their performance. Harris defines the term "inservice education" to mean "any planned program of learning opportunities offered staff members of schools, colleges, or other educational agencies for purposes of improving the performance of the individual in already assigned positions" (Harris 1989, pp.18).

Harris sees an improvement of instruction as the goal of inservice education. He sees inservice training as an essential part of staff development. There are many ways to support staff development, but inservice education seems to be the most promising way in the future (Harris 1989).

In Finland the interest and need for teachers' inservice training arose in the middle of the 1970's. The result of this need was a quantitative growth of short-term inservice training sessions meant for all kinds of teachers. A typical Finnish inservice training session is a very general VESO-presentation which is a short-term lecture on some immediate topic of interest. The quality of teachers' inservice training has been questioned, and there have been plans to improve it in the future (see e.g., Alikoski 1982). Instead of very general, short-term presentations it has been proposed that alternative training which is long-term and qualitatively high is needed. One way to raise the quality of teachers' inservice training is to allocate some responsibilities to the universities. The universities have the most recent knowledge in educational issues and they need to get feedback from working teachers to be able to use it in teacher education.

Alikoski views the general purpose of teachers' inservice training as an improvement in the quality of all the schools in Finland. That goal includes the accountability aspect - improvement in the learning results. The other aspect is the improvement in the general atmosphere of the schools. To reach these goals different alternatives are needed in teachers' inservice training in the future. We need personal, general inservice education and training which supports the growth of an individual teacher. Additionally we need professional inservice training which is school centered and serves the school. Such professional inservice training can be divided into inservice training that serves the professional and career development of an individual, and inservice training which is school-based and serves the needs of the school (Alikoski 1982, pp.253-260).

Hämäläinen (1988b) considers some common trends in teachers' inservice training in the United States and in Europe. The trend seems to be towards:

- School-based inservice training in whic the entire personnel can be trained at least partly at the same time to meet the development needs of their school.
- Problem-centered inservice training which starts from the needs in the school or from the needs of an individual teacher.
- Long-term inservice training which should last at least 2-5 years to be effective.
- The training should take a form of consultation. The teachers should become active in solving the problems in their school and in obtaining new information by themselves.
- The teachers role should be changed from a receiver to an active participant in a learning situation.

To meet the needs of different teachers we need different kinds of inservice training. At the beginning of teacher's career practical training in different teaching methods might be needed, and the more advanced teachers might profit from workshops discussing different philosophical orientations and building their own philosophy of teaching.

4.3. ACTION RESEARCH

In recent years action research has become an influential way to support teachers' professional development. Action research has a long history in education, but only recently has it been seen as a vehicle for preparing reflective teachers (Zeichner 1987).

In action research the teacher adopts the perspective of the researcher and does research in his own classroom. The goal in action research is that a teacher get tools for developing his own work. Kemmis has defined action research as a form of self reflective inquiry undertaken by participants in a social setting in order to improve their own practices, their understanding of these practices and the situations in which they are carried out (Kemmis 1985).

Action research relies on observation and behavioral data, but interprets the scientific method pretty loosely. Its objective is situational and specific but the sample used is restricted and nonrepresentative. Action research deals with a concrete problem located in an immediate situation. The primary justification for the use of action research in the context of the school is improvement of practice. Action research can be applied by a single teacher operating on his own with his class trying to solve an actual problem in his classroom. A group of teachers can apply action research by working cooperatively within one school and trying to solve a common problem. Advocates of action research find cooperative research the most effective. The most popular way to do action research has been a team of teachers working alongside a team of researchers in a sustained relationship possibly with other interested parties such as advisors (Cohen & Manion 1985).

Cohen and Manion identify some areas in school life where action research could be used and illustrate each area with a concrete example:

- Teaching methods: for example, replacing a traditional method by a discovery method.
- Learning strategies: adopting an integrated approach to learning in preference to a single-subject style of teaching and learning.
- Evaluative procedures: improving one's methods of continuous assessment.
- The realm of attitudes and values: possibly encouraging more positive attitudes to work, for instance, or modifying pupils' value systems with regard to some aspect of life.

- The personal inservice development of teachers: improving teaching skills, developing new methods of learning, increasing powers of analysis, or heightening self-awareness.
- Management and control: the gradual introduction of the techniques of behavior modification.
- Administration: increasing the efficiency of some aspect of the administrative side of school life (Cohen & Manion 1985, pp.216-217).

Finnish educators have acknowledged the usefulness of action research for teachers' professional development. To reach the goal of the autonomous, reflective teacher, teacher education and teacher inservice training should use action research in training teachers (Kohonen 1989). Leino (1991) has used the action research method in his five-year project with Finnish primary and secondary teachers. The main goal of the project was to make school knowledge dynamic; i.e., knowledge was to be acquired for a particular purpose and its use considered meaningful by the students as well as by the teachers. The first goal of the project was to familiarize the teachers with microcomputers and their pedagogical use. Participation in the project was voluntary and the basis for development was teachers' small group activities. The groups of 7 to 12 teachers decided on the objectives of each experimental year, planned and carried out the inservice education needed for attaining the objectives.

In action research the teacher can integrate the theoretical knowledge of his education and the teaching practice. Action research is a flexible method and can be combined with supervision, inservice training and with other methods aiming to help the teachers grow in their profession.

4.4. SCHOOL CONSULTING

In the United States school consulting has long been viewed as one of the ways to help teachers to do their work better. In Finland the training of school consultants began in 1984, and consulting is not yet widely approved by Finnish educators. The scientific basis of consulting has been questioned, and it has been seen as a possible new way to control the teachers (Simola 1988).

Consulting and supervision have many common characteristics, but they also differ from each other in some areas. Consulting is usually short-term and very task oriented. Supervision has to be long-term to be effective, and is not limited to certain tasks (Ojanen 1985, pp.60-61). Hämäläinen identifies three different types of consulting in the schools: consulting on the content, process consulting and consulting on organization development (Hämäläinen 1988a).

In consulting on content the consultant is a specialist in his field. The goal in consulting is the learning of the client and the change in his behavior. Often the consultant is in the role of a technical specialist and helps the teacher choose the content or methods of her teaching. The areas in consulting can be very concrete, for example using a new computer system or developing some new teaching methods.

In process consulting the central issue is not the school personnel results. The main concern is the functioning of the school. The consultant tries to affect the attitudes and the behavior models of the personnel. The consultant might for example help the teachers to solve mutual problems and conflicts, and to teach them to communicate with each other. He plays the role of an objective party in those issues and situations that are difficult for the personnel. The important goal in process consulting is to teach the personnel to analyze the real problems, their causes and things that affect finding a good solution.

OD-consulting covers all the areas in the development of organization including the issues in content consulting and process consulting. The consultant might for example help the teachers to understand children from different social and cultural environments and to work effectively with them. Another area can be helping the teachers to use the most recent research findings in education in developing their own teaching (Hämäläinen 1988a).

School consulting is still a very recent innovation in helping the teachers to grow professionally. It might work well for example in teachers' inservice training where training personnel are needed. To eliminate the feeling of control, consulting should be voluntary and be based on the need of an individual teacher to get guidance from an outsider.

4.5. PROFESSIONAL DEVELOPMENT SCHOOLS

One of the ideas of educational reform proposals in the 1980s was the creation of professional development schools as centers of inquiry and learning for prospective and practicing teachers alike. These schools were to be analogous to teaching hospitals where teachers and university faculty members would join in doing research, improving practices, and educating teachers (The Holmes Group 1986, The Carnegie Forum on Education and the Economy 1986).

The emergence of professional development schools is not an new invention in educational reform. These schools have existed in many forms since the late nineteenth century, and schools go by many different names (e.g., professional-practice schools or portal schools) (Stallings & Kowalski 1990). In many teacher education programs across the United States efforts have been under way for several years to situate the teacher education practicum in specific schools within the public system; schools which have made a special commitment to the preparation of prospective teachers.

The professional development schools are often schools jointly controlled by school systems and universities. University faculty, teachers and administrators are finding new ways of working with one another based on the belief that clinical teacher education needs to be shared responsibly among equal partners. This movement to restructure the practicum has involved major changes in the roles of the faculty involved in teacher education. The classroom teachers are acquiring greater power in building the teacher education curriculum and the university faculty is playing a greater role in supporting and helping to institutionalize school reforms. In the professional development schools professors and teachers are trying to create genuine collaborations which demonstrate respect for the knowledge and expertise that all parties bring together (Zeichner 1992, pp.26-27).

Zeichner lists three major dimensions of a professional development school: the focus on pupil learning, the emphasis on teacher development (preservice and inservice) and on school restructuring and reform. In teacher education practicum in a PDS the entire school is involved in the induction of student teachers. The student teachers appreciate the opportunity to work with a variety of school staff instead of just one cooperating teacher and the collaborative approach to teaching.

A central dilemma in establishing a professional development school (PDS) is what kind of school should be designated as a PDS site. Recent literature on the topic suggest a move away from the traditional laboratory school model and toward establishing professional development sites in "typical schools"

(The Holmes Group 1990, Goodlad 1990). Zeichner sees a danger of elitism in assigning a site as an professional development school. These emerging professional development schools can become so special that they cater only to the already advantaged. These schools can be seen as such wonderful models that it becomes impossible to replicate them anywhere else. Fortunately, many of the newly emerging PDS's are not moving in this direction. Many of these schools are emerging in the places where the challenges are the greatest, in the schools serving mostly low income students of color, schools with records of low performance on achievement tests (Pugach & Pasch 1992).

Situating the teacher education practicum in schools like these makes it possible for the preservice students to participate in the process of changing schools. They learn to see and value professional development in the schools where everybody views themselves as learners, reformers and researchers. Zeichner argues that locating the practicum in schools like these involves the affirmation of a commitment to the preparation of teachers to serve everybody's children (Zeichner 1992).

The professional development schools are ideally places where the needs of preservice and inservice teachers are met. Collaboration and collegiality between teachers and university faculty is encouraged. The student teachers see many different methods and models of teaching and are encouraged to be an active part of the school reform. One of the most important questions in developing a PSD site is to gain the right balance between demonstrating the best practice to student teachers and addressing professional development across the continuum of teacher education.

4.6. TEACHER PORTFOLIOS

One of the newest resource potentials for teachers' professional development is the idea of teacher portfolios. Teacher portfolios are collections of artifacts of teachers' practice evidence. They can include notes, lesson plans, observations of one's teaching done by somebody else, students' evaluations of the teacher, videotapes of teacher's own teaching together with written analysis. Portfolios are about everything in teaching over a longer period of time.

At Stanford University a teacher portfolio project was instituted at the Stanford Teacher Education Program (STEP) (Lichtenstein et al. 1992). The student teachers collected their own teaching portfolios during the student teaching year. The project was highly experimental and the purpose of the portfolios was to foster professional development of the student teachers, not to use them as a way to evaluate them.

The first step for the student teachers in the portfolio project was to formulate a question around which their inquiry would revolve. The portfolio question had to arise from their own experiences in the classroom. The students were encouraged to pursue a question they didn't know the answer to and in which they were deeply interested. For most of the students it took ten weeks to formulate their question.

The next phase was to write narrative introductions (rationales), which they shared with each other regarding the circumstances and experiences that made the question important to them. The teachers responded to each others' introductions in writing and discussions. The teachers also started to collect artifacts, pieces of evidence drawn from their practice. Artifact collection continued throughout fall and winter quarters, into early spring quarter. The third part of the project was teachers' reflection on the artifacts collected. The reflection became the glue joining the presenting problem or situation, the artifacts, and teachers' actual practice.

The final drafts of teachers' reflections along with pertinent artifacts were handed in for review and comment and then returned to the teachers. After that the student teachers participated in a conference designed to display their portfolios. Working in teams by portfolio topic or subject area, students created presentations that demonstrated the knowledge they acquired throughout the year.

The students found the portfolio project very helpful for their professional development. They also stated that they were able to maintain the collegiality and opportunities to reflect on their practice during their teacher training as full-time teachers. STEP portfolios were not representations of students' best work. The students were encouraged to reflect carefully on both their successful and unsuccessful lessons and experiences, and to include all relevant artifacts and insights in their entries. The essential value of portfolios is that they create a meaningful context in which to discuss the demands of practice and the value of research-based knowledge. This context can serve as a middle ground between university and classroom experiences.

The student teachers were engaged in critical thinking about issues that concerned them and that broadened and deepened their understanding of those things. The purpose of portfolios is to develop the teachers' professional ability to interpret classroom situations and act on understanding gained through reflection (Lichtenstein et al. 1992).

Portfolios can be seen as one of the ways in which we can encourage reflective thinking in teachers. It greatly resembles action research, the teacher himself formulating the research question and collecting his own data. The portfolio can serve as a valuable resource in a teacher's own evaluation of his teaching. The teacher can collect his own history as a teacher in the portfolio and reflect on his own professional development during his career. If teachers are trained in this kind of formative evaluation during the teacher training we can assume that they are also more active in evaluating their own teaching as inservice teachers.

4.7. SELF-EVALUATION

One way to support teacher's professional growth is to develop tools for self-evaluation for them. A competent teacher should be able to evaluate his own work. One goal already set in student teaching is to deepen the self-understanding of the student. The Committee on Practice Teaching finds guiding the student teacher personality development very important. This guidance should include self-evaluation of student teachers to enable active involvement in developing their personality (Anon. 1983, pp.24).

Yrjönsuuri (1990) has studied teachers of different ages from comprehensive school, and their conceptions about the adequacy of their knowledge and skills acquired in the basic teacher training. In his study the teachers evaluated the adequacy of their education for different tasks included in teacher's work. This study was not a self-evaluation of the teaching skills done by teachers, but was aimed at their training and its adequacy.

If the teaching profession is viewed as a profession which requires continuous training and development, it is very important to develop tools for teacher self-evaluation. The evaluation should be aimed at the current situation: what kind of skills and knowledge do I have today to work as a teacher? In this study we have aimed at developing a self-evaluation tool for teachers which would support their professional development.

There are several reasons to develop procedures for self-evaluation:

1. We can assume that the teachers find self-evaluation less threatening than the evaluation done by somebody else. In Canadian studies the teacher's attitudes towards self-evaluation have been positive (Ryan & Hickcox 1980).
2. Self-evaluation can help the teacher to clear her image of herself as a teacher. It can show the teacher some routine behaviors, and encourage seeking new challenges in the teaching profession. When the quality of teaching improves, the satisfaction in the profession may increase at the same time.
3. By evaluating his own teaching the teacher can be an example to his students in the continuous desire to learn new things and to develop in the profession.
4. Teachers' self-evaluation data is a viable starting point for both indirect and direct supervision. In indirect supervision the data from the teacher's self-evaluation can be used as a help in discussion. Self-evaluation shows the teacher the areas where he needs supervision. In direct supervision the self-evaluation data can guide the direction to areas for classroom observation. It might be easier for teacher to let somebody observe his teaching when he has been allowed to decide in what kind of things he needs help.
5. Teachers' self-evaluation can be implemented in teachers' inservice training. In school-based inservice training it renders the need for inservice training of the teachers more practical.

Self-evaluation can be viewed as a form of evaluation that suits an autonomous, reflective teacher in helping him to continuous growth and development in the teaching profession. It is easy to implement because it doesn't require large personnel or financial resources. Self-evaluation can be combined with supervision or inservice training. Implemented by itself it would also still serve the teacher in many ways by providing constant feedback from his own teaching.

Chapter 5

THE EMPIRICAL FRAMEWORK

> *...For no one but lunatic makes hypotheses out of thin air. There are always some previous inductive, even if unconscious, reasonings from scattered observations, as in the instance above, which generate the hypothesis. Scientific work begins with data observation and returns to data observation, though the first encounter may be unsystematic...*
>
> *–Cattel 1978*

5.1. GENERAL FOCUS OF THE RESEARCH

In the theoretical part of this study we have reviewed current American and Finnish research in teachers' professional development. We have discussed different reform traditions in teacher education and analyzed the positive and negative characteristics in each of the traditions. Based on the analysis in previous chapters we found that an autonomous, reflective teacher is a widely accepted goal in teachers' professional growth. We also discussed different methods to help the teacher to reach this goal with the emphasis on the method of self-evaluation.

From this theoretical discussion it can be concluded that focusing on the development of the self-evaluation approach offers a substantial contribution to the professional growth of a teacher. It is very unlikely that the many-faceted nature of reflective teaching can be captured by any single evaluation method. Our attempt in this respect is more modest, the empirical instruments considered here concentrating on identifying the basic skills of effective teaching, a goal which proves to be difficult enough to achieve. Thus we focus on evaluating skills from the first level of Clarke's theory (see discussion in Section 3.4) and admittedly the approach we have adopted has a behavioristic flavor. However, regardless of the viewpoint one adopts to the goals of teacher professional growth, it is hard to imagine that elementary teaching skills could be totally neglected. Therefore restricting ourselves to such basic skills leads us to the "core", i.e., common denominator of the various different approaches.

For an empirical study the general framework of self-evaluation has to be realized by focusing on a particular instrument. For such an instrument we have chosen the Developmental Teacher Evaluation Kit (DeTEK) (Harris &Hill 1982) tool as a basis for such an instrument. This choice has several advantages: the instruments in DeTEK are based on a long-term research effort with a theory base in American teaching effectiveness research (for example: Ryans 1960, Dunkin & Biddle 1974) and with empirical support for the validity of the approach (Harris 1986, Harris 1985). In addition it provides us with an instrument with an explicit model of the abstract components of effective teaching (with respect to the basic skills level).

As any model intended for the measurement of effective teaching is highly debatable, our intentions are not to simply apply the instrument to a teacher population and then report the results. In fact we will not report the actual results beyond what is needed to carry out our primary task. Instead we aim at contributing to the general goal of studying effective self-evaluation methods for reflective teacher development by performing an extensive study on the applicability of the Harris and Hill model (Harris & Hill 1982) as a model of the basic skills in effective teaching. Studying the invariance of such a model gives us information beyond individual statistical results or usefulness of this particular model. It allows us to identify a set of general problems in developing universal models for effective teaching skills, and hence assist in developing better models for this important task.

Since the "Harris model" is based on the American research tradition as well as empirical studies in the United States, in the light of the previous discussion our main task is to focus on the cross-cultural validity of the Harris's model. In particular, we will study the question whether or not the model is biased with respect to the different teacher education (teaching) traditions. As indications for such a bias can be found, we will investigate the hypothesis that the model better fits the data from the tradition within it was developed. For this reason we will first empirically compare the validity of the model as applied to the data both from United States and Finland and test this hypothesis (Chapter 6).

As will be seen, significant differences can be found in a straightforward attempt to fit the model structure to the data regardless of whether the data is from United States or Finland. Consequently we will proceed to the more detailed identification of the various abstract structures underlying teacher classroom behavior as implied by our data. To be true to our original goal of studying the universality of the model with respect to different teaching traditions, we will also compare the American and Finnish structures identified. Such a comparison also raises the question whether or not cross-culturality can be seen as a discriminating factor in teaching behavior. Consequently in the last phase of the current study we progress by identifying the discriminating components reflecting cross-culturally in the US and Finnish data at hand.

5.2. THE MEASURING INSTRUMENT

5.2.1. THE DETEK MODEL

The self-evaluation instrument in our study has been adapted from a larger evaluation system called DeTEK: Developmental Teacher Evaluation Kit (Harris & Hill 1982). This teacher evaluation system has been developed since 1958 by professor Harris from the University of Texas at Austin and his colleagues. They have been involved in developing, testing and utilizing classroom observation instruments to make teacher evaluation objective and reliable. During the development of DeTEK thousands of school principals, supervisors, and teachers have been involved in developing the instruments, observing their peers and in managing a teacher evaluation system. The nature of DeTEK is highly collaborative, flexible and not summative; i.e., not only aiming at identifying and discarding poor teachers.

DeTEK assumes that teacher performance is of critical importance to student learning. It also assumes that teachers as professionals, can and should improve their on-the-job performance and that they are willing to make a commitment to professional growth. DeTEK is based on the assumptions that consistent patterns of performance across a wide array of teacher behaviors are desirable goals for professional growth. While granting that teaching is much more complex that any limited set of performances or behaviors would imply, the design of DeTEK assumes that certain selected behaviors can be defended as constituting an essential core of performances. Based on these prerequisites, the prime objective of DeTEK is the improvement of instruction on the part of all teachers, regardless of their specialization, prior experience, or level of sophistication. DeTEK should be used to guide the systematic analysis of teacher performance. It can identify specific accomplishments and competencies, and diagnose specific needs for improvement. As such, the system is intended to be used in developmental evaluation only.

DeTEK is a de facto definition of what is a developmental system, its objective being to encourage a gradual emergence of collaboration among school staff groups, which is lacking from the more traditional summative evaluation process. Equally important is the system's emphasis on an ongoing developmental evaluation process. As accomplishments, needs or uncertainties are identified, recycling alternatives are provided to assure a teacher's continuing improvement. The DeTEK system is implemented via a tool kit (Harris & Hill 1982).

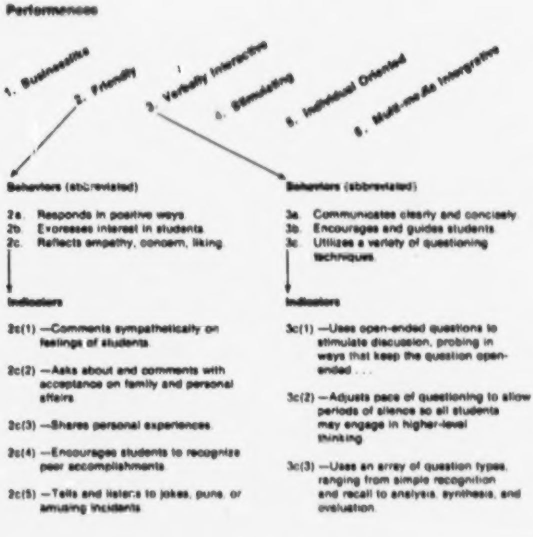
Performances
1. Businesslike
2. Friendly
3. Verbally Interactive
4. Stimulating
5. Individual Oriented
6. Multi-media Intergrative
Behaviors (abbreviated)
2a. Responds in positive ways
2b. Expresses interest in students
2c. Reflects empathy, concern, liking
Indicators
2c(1) —Comments sympathetically on feelings of students
2c(2) —Asks about and comments with acceptance on family and personal affairs
2c(3) —Shares personal experiences
2c(4) —Encourages students to recognize peer accomplishments
2c(5) —Tells and listens to jokes, puns, or amusing incidents
Behaviors (abbreviated)
3a. Communicates clearly and concisely
3b. Encourages and guides students
3c. Utilizes a variety of questioning techniques
Indicators
3c(1) —Uses open-ended questions to stimulate discussion, probing in ways that keep the question open-ended . . .
3c(2) —Adjusts pace of questioning to allow periods of silence so all students may engage in higher-level thinking
3c(3) —Uses an array of question types, ranging from simple recognition and recall to analysis, synthesis, and evaluation

Figure 5.1. The organization of the DeTEK criteria; performance areas include behaviors which are defined by indicators (Harris & Hill 1982, pp. 5).

One of the central features of Harris's DeTEK system is a carefully specified set of criteria for the evaluation of teacher performance. This set of criteria is hierarchically organized. DeTEK specifies six performance areas of major importance in classroom teaching. Each of these areas comprises a set of three to four specific behaviors, for a total of twenty-two behaviors. Finally, each behavior is defined by three to seven indicators - specific actions, each of which identifies an aspect of that behavior (see Figure 5.1.). The six performance areas forming the criteria set are:

1. *Businesslike,*
2. *Friendly,*
3. *Verbally Interactive,*
4. *Stimulating,*
5. *Individually Oriented,*
6. *Multi-Media Integrative.*

The DeTEK tool kit includes the Criteria List which lists each of the twenty-two behaviors with its respective indicators grouped by performance areas. With very few exceptions the performance criteria selected for use in DeTEK are supported by studies of teacher effectiveness, or other studies relevant to teaching method and instructional design. The six performance areas were selected by virtue of the variety of theories of learning and teaching they reflect. In validation efforts prior to the final selection and editing of these performance criteria, Harris and Hill were guided by research findings as well as theories of teaching and learning, and recent practices adopted by school districts in the United States. The selection process of performance criteria will be discussed more in the chapter 5.2.2.

5.2.1.1. THE STRUCTURE OF THE DETEK PROCESS

An effective evaluation system requires a logically organized sequence of events. The DeTEK system utilizes the broader criteria - performances and behaviors - as the basis for an initial survey that includes both teacher self-analysis and classroom observation. This survey leads to a more detailed focus on only a limited number of behaviors. The subsequent diagnosis uses input from self-analysis as well as focused observation, and other supplementary data. The analysis of these multiple sets of data leads to diagnosis and planning for professional growth. This process, utilizing seven instruments, progresses in a ten-step sequence through four phases. This process is illustrated in Figure 5.2.

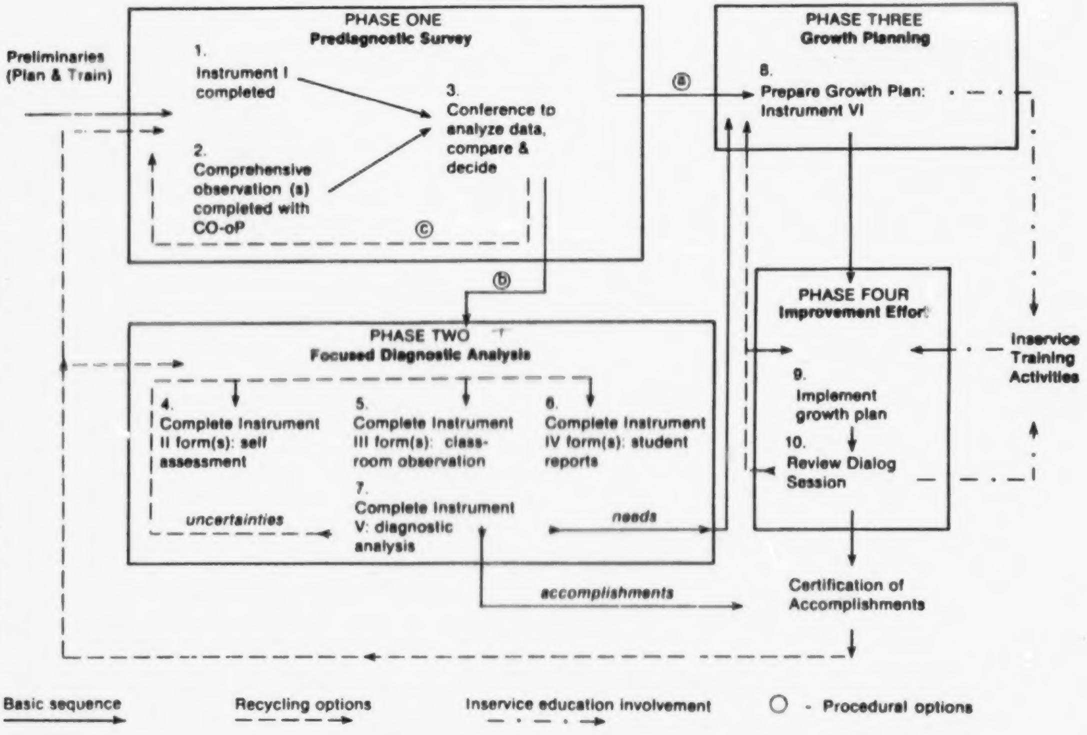
PHASE ONE
Prediagnostic Survey
Preliminaries (Plan & Train)
1. Instrument I completed
2. Comprehensive observation (s) completed with CO-oP
3. Conference to analyze data, compare & decide
ⓒ
ⓐ
ⓑ
PHASE THREE
Growth Planning
8. Prepare Growth Plan: Instrument VI
PHASE TWO
Focused Diagnostic Analysis
4. Complete Instrument II form(s): self assessment
5. Complete Instrument III form(s): classroom observation
6. Complete Instrument IV form(s): student reports
7. Complete Instrument V: diagnostic analysis
uncertainties
needs
accomplishments
PHASE FOUR
Improvement Effort
9. Implement growth plan
10. Review Dialog Session
Inservice Training Activities
Certification of Accomplishments
Basic sequence
Recycling options
Inservice education involvement
○ - Procedural options

Figure 5.2. The DeTEK ten step sequence (Harris & Hill 1982, pp. 15).

A detailed description of each of these phases and steps in the process is presented in the original definitive text by Harris and Hill (1982). A more detailed discussion of the phases is also given in our previous study together with a brief overview of each instrument's features, its contribution to the total process and the relationships between the instruments (Tirri 1991, pp. 54-68).

For this study it is sufficient to focus on the criteria of effective teaching defined in the DeTEK criteria list and the self-evaluation done by a teacher in the first phase of the process. Although the whole DeTEK evaluation system is interesting and has the potential for adoption in Finland, these possibilities are not addressed here. For more discussion on the several issues related to adaptation of DeTEK the reader should consult our previous study where these options are further explored (Tirri 1991).

5.2.2. SELECTING CRITERIA FOR GOOD TEACHING IN THE DETEK MODEL

As mentioned above, one of the controversial key issues of the DeTEK model of effective teaching is the selection of the performance areas and their behavior criteria. In DeTEK the focus in selecting these behaviors has been on those specific teaching practices which are most likely to produce more student learning (Harris 1986, pp.69). The DeTEK criteria list accentuates instructional processes only, and specifies criteria only in terms of teacher performance. The selection of performances are limited to those behaviors that clearly relate to learning outcomes. To be able to define such teaching behaviors Harris makes the following assumptions:

- Teaching is behavior that can be studied.
- Teaching behavior tends to be patterned, not random or erratic.
- Patterns of teaching behavior should be selected for guiding the evaluation and improvement processes.
- Selected patterns of behavior should reflect theory, research, and professional wisdom.
- Detailed explication of these selected patterns of behaviors should be systematically undertaken to communicate and provide foci for observation and diagnostic and improvement efforts (Harris 1986, pp.79).

In selecting the criteria for his teacher performance model Harris relies on the results of teacher effectiveness research, current research theory and professional wisdom. He builds on Ryans's (1960) classic study of teacher characteristics. Ryans provided categories for specifying teacher performances patterns. In the original study, three major "classroom behavior patterns" were identified as the most discriminating factors:

- X_0 Empathetic (warm, responsible, kind)
- Y_o Systematic (systematic, businesslike, organized)
- Z_o Stimulating (stimulating, original, imaginative)

Harris reviewed the research on teacher effectiveness over the past thirty years and found support for specific practices related to each of these three patterns; consequently he included these three patterns in the DeTEK model on which the criteria list is based. In Figure 5.3. we illustrate Ryans's patterns with abbreviated statements of specific performances recognized by various scholars as having strong research support. Choosing Ryans's characteristic patterns as the basis of the performance areas in the model is naturally debatable. Since Ryans's research was conducted, his study has also faced criticism, e.g., Hytönen (1970) has criticized some methodological aspects of Ryans's study. On the other hand, in investigating the teaching behaviors of student teachers, Hytönen found similarities in the factors of his study with Ryans's factors. Pattern Y_0 and Hytönen's conscientious teaching can be seen as characterizing the same kind of teaching behavior. Pattern Z_0 and tentatively the Pattern X_0 have similar characteristics with flexible teaching behavior in Hytönen's study (1970, pp.130).

For some teaching performance patterns the research is limited or not enlightening. In these cases Harris has used theoretical support and professional wisdom to be able to identify the desirable behavior. For example, Flander's system of interaction analysis suggests criteria such as "accepting and using students' ideas". This behavior is thus included in DeTEK criteria list of teaching behaviors. Similarly, various individualized efforts to differentiate assignments, promote independent study, and increase small group activity are not clearly supported by all research, but still seem worthy of use as teaching practices. For a more thorough discussion on the topic, the reader should consult the original text by Harris (Harris 1986, pp.72).

Ryan's Teacher Characteristic Patterns	*Selected Practices**	*Scholarly Support†*
X_σ—Warm, friendly, empathetic	1. Interacts with students in positive ways	(1) (4) (3) (7)
	2. Expresses interest in students	(2) (3)
	3. Reflects empathy, concern	(7) (3)
	4. Demonstrates interest	(3)
	5. Encourages and guides students	(1) (4)
	6. Participates with students	
	7. Interacts with individuals	(4)
Y_σ—Organized, systematic, businesslike	8. Organizes classroom activities	(2) (3)
	9. Informs students of	
	10. Delegates responsibilities	(2) (4)
	11. Paces activities	(3)
	12. Communicates clearly	(3) (1)
	13. Collects, organizes diagnostic data	(3)
	14. Plans to meet unique individual needs	(3)
Z_σ—Stimulating, creative, imaginative	15. Expresses interest in subject	(3)
	16. Presents subject matter in	(1)
	17. Draws on student interests	(1)
	18. Utilizes a variety of questions	(1)
	19. Responds spontaneously	
	20. Uses audio-visual manipulative aids	(2)
	21. Involves students in multi-sensory ways	
	22. Directs instruction to unique needs	

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*Abbreviated statements from *Developmental Teacher Evaluation Kit* (1982).

†(1)=Gagne, 1978; (2)=Rosenshine, 1970; (3)=Medley, 1972, 1977, 1979; (4)=Stalling and Kaskowitz, 1974; (5)=Dunkin and Biddle, 1974; (7)=Flanders

Figure 5.3. Selected practices in DeTEK criteria supported by research on teacher evaluation (Harris 1986, pp.71).

Teacher practices as performance specifications are given support by acceptance in the field as well as by research and theory documentation. Harris observed that the evaluation instruments used in some 16000 school districts reflect many similarities in teacher performance expectations

(Harris 1986, pp.71). A comparison of evaluative criteria utilized in seven school districts with those in the Harris-Hill DeTEK System revealed many similarities. The percentage of agreement with the 22 behaviors selected by Harris and Hill (presented in Figure 5.4.) range from 70 to 100, with all but two of the seven districts in nearly perfect agreement on these classroom-focused performance expectations (Harris 1986, pp.71-72). These empirical observations together with the criteria derived from the earlier studies and the literature form the basis of the behavior criteria, and the performance areas suggested by the original DeTEK model. This coincidence with practice can also be seen as indirect evidence of the construct validity (Anastasi 1988, pp. 153-162) of the instrument with respect to the theoretical framework on effective teaching on which the DeTEK method is based.

One final observation: after selecting a limited number of clearly recognized categories these performances are described in increasing detail at each of several levels of explicitness (Harris & Hill 1982). The performance areas are explicated with teaching behaviors and the behaviors are described with illustrations of specific teaching events. All this explication is performed in order to make it easier to communicate with all the parties involved in the evaluation process.

5.2.3. DETEK CRITERIA FOR GOOD TEACHING IN THE LIGHT OF CURRENT RESEARCH ON EFFECTIVE TEACHING

The teaching effectiveness research used in developing DeTEK criteria is mostly dated from 1950 through 1975. Thus we want to adapt the DeTEK criteria to the modern context also and review the findings of the current teacher effectiveness research (1975-1990) with respect to the criteria chosen in DeTEK. We will proceed by describing one performance area at a time, and relate it to the concepts discovered in the teaching effectiveness research.

Businesslike

The DeTEK performance area "Businesslike" includes teacher behaviors that describe the teacher as organized, systematic, goal-oriented, and prepared. The new research overwhelmingly portrays the effective teacher as task-oriented, organized, and structured, nothing less than Ryans's (1960) pattern Y and Harris's businesslike teacher (Ornstein 1991).

TEACHER ORGANIZATION

In a recent review of teaching effectiveness research (O'Neill 1988) teacher organization was identified as one of the most promising instructional research factors on teaching effectiveness at the preactive stage. It includes advanced planning and preparation in accordance with selecting proper learning objectives, diagnosing individual needs, gathering materials and supplies, and choosing appropriate teaching strategies. Well-organized teachers are found to be the most effective teachers (Anderson, Evertson, & Emmer 1980, Doyle 1981, Good 1979, Ornstein & Levine 1981). However, in adapting these results one should observe the context of these studies. They are mostly confined to elementary and junior high school students from low socioeconomic and middle socioeconomic backgrounds (O'Neill 1988, pp.166). From such a background, students have a particular tendency to need close supervision, which increases the importance of the teacher's organizational abilities.

CLASSROOM MANAGEMENT

The evidence of current research on teaching effectiveness shows that well-managed classrooms are strong determinants of student learning (Anderson et al. 1980, Emmer et al. 1980, Evertson et al. 1980, Good & Grouws 1977). Classroom management consists of implementation, administration, and enforcement of work habits, regulations, and routines. Effective teachers are managers who run classrooms with a minimum amount of student disruption (O'Neill 1988, pp.169).

Both Berliner (1986) and Shulman (1986) strongly advocate that case studies of expert teachers should form a part of teacher education programs. The Exemplary Practice in Science and Mathematics Education study tried to answer the questions: what is an exemplary teacher and what can be learned from investigations of such exemplary practices (Tobin & Fraser 1991)? In this study thirteen exemplary science teachers and seven exemplary mathematics teachers from schools in the metropolitan area of Perth, Western Australia were identified through a nomination process. The university faculty, teachers and State Education Department personnel submitted names of the "above-average" teachers. Teachers with the most nominations were invited to participate in the study.

The data for the study were obtained by participant observers who directly observed at least eight lessons by these teachers. The observers also interviewed the teachers and students, and examined the curriculum materials, tests and student work. The data were primarily qualitative and the observers discussed their field notes with each other and formulated assertions which were consistent with the observations.

One of the main findings of the Exemplary Practice in Science and Mathematics Education study was the high level of managerial efficiency of the teachers. These exemplary teachers used managerial strategies that facilitated sustained student engagement. The teachers maintained control over the entire classroom and actively monitored student behavior by moving around the room and speaking with individual students from time to time. There was an easy flow from one activity to the next, students knew what to do and appeared to enjoy working in the classroom. Although the teachers used different styles and approaches in their classes in all case studies the crucial link between management, teaching, and learning was highlighted (Tobin & Fraser 1991, pp.222-224).

TIME-ON-TASK

In the Texas Teacher Effectiveness Study (Brophy & Evertson 1977) presage-outcome data revealed that the teachers who produced the most achievement were businesslike and task oriented. They enjoyed working with students but interacted with them primarily within a teacher-student relationship. They spent most of their time on academic activities. The Beginning Teacher Evaluation Study (BTES) supported the effectiveness of businesslike teaching behavior. The BTES authors combined allocated time, engaged time, and success rate into the concept of academic learning time (ALT), which they defined as the time students spent engaged in academic tasks that they could perform with high success. ALT consistently showed significant positive correlation with achievement (Berliner et al. 1978).

Academic learning time (also known as time-on-task or active learning time) is restricted to the amount of time students are actively engaged in task-oriented activities. In the review of teaching effectiveness research time-on-task is listed as one of the most powerful predictors of student achievement (O'Neill 1988, pp.173). In the Classroom Environment Study (IEA) observations were conducted in 429 classrooms located in eight countries. This study is the largest cross-national observational study of schools and classrooms up to date. The findings indicated that classroom teaching is very similar around the world. From country to country teachers relied heavily on whole class instruction. Time-on-task was related to the students' achievement. Students who spent more time engaged in learning tended to achieve higher post-test scores (adjusted to pretest scores) (Anderson et al. 1989).

On the other hand one should observe that "time-off-task" can also be valuable for students' learning. The two-year study of primary students in an urban elementary school revealed that spontaneous talk supported the intellectual development of the children in the context of writing stories. The "academic" and the "social" are not so simply separated. The laughing, teasing, correcting, and chatting that accompany childrens' academic work can be catalysts for intellectual growth (Dyson 1987).

DIRECT INSTRUCTION

Direct instruction is synonymous with explicit teaching (Rosenshine 1987) or teacher-centered instruction. In direct instruction the teacher is businesslike and proceeds in small steps, checking for student understanding, thus achieving active and successful participation by all students. Direct instruction can best be applied to areas of the curriculum that can be broken down into small steps, for example grammar concepts such as subject and predicate, foreign language learning or playing musical instruments. The common conclusion of recent research is that direct instruction is highly related to increased learning gains in teaching explicit concepts and skills to low achieving students (Ross & Kyle 1987, O'Neill 1988). It seems natural that low achieving students need more explicit concept descriptions than gifted ones, who are able to exercise higher cognitive skills from less direct instructions.

Friendly

The performance area "Friendly" describes the teacher attitudes such as warm, emphatic, outgoing, positive and personal, very much the same qualities which are used in Ryans's (1960) pattern Xo. This performance area concentrates on the affective side of teaching behavior. A friendly teacher is capable of creating a positive classroom climate which is reflected in the tone of communication, teacher gestures and interpersonal relationships.

CLASSROOM CLIMATE

The research on the effects of classroom climates favors a supportive and warm climate (O'Neill 1988, pp.168-169). Other adjectives used for an effective classroom climate include pleasant, democratic, personal and understanding, all qualities in accord with Harris's teaching behaviors in the performance area Friendly.

TEACHER FEEDBACK

The research evidence suggests that feedback is most effective on a regular or systematic basis, and when it is immediate and prompt (O'Neill 1988, pp.175). According to Brophy and Good (1986) regular, continuing feedback correlates with higher student achievement. In general this feedback takes two forms: teacher criticism and teacher praise.

Teacher criticism refers to negative feedback given to the students, which goes beyond simple correction. This kind of negative feedback could involve belittling, ridicule, scolding, sarcasm or shouting (Westbury 1988, pp.144). Research indicates that effective teachers minimize such criticism as it consistently correlates negatively with achievement (O'Neill 1988, pp.176-177). This is reflected in the DeTEK criteria list as including behaviors that avoid giving criticism to students.

Praise is positive feedback with verbal approval. Research has traditionally reported praise as a facilitator of effective teaching (for example Good & Grouws 1977). However, the recent research is contradictory on this issue reporting weak and mixed correlations between praise and student achievement. Praise seems to be more effective for particular types of students and in particular contexts. It is most effective when personalized, more important to girls than to boys and more important to students from low-income settings (Westbury 1988, pp.145).

Verbally Interactive

The performance area "Verbally Interactive" includes teaching behaviors that stress verbal interaction techniques. These techniques are to enhance clarity of communication, stimulate verbalizations by students, and provoke higher-level thought processes.

CLARITY

Clarity can be defined as simplicity of expression (Westbury 1988, pp.142). Teaching effectiveness research has revealed a positive relationship between teacher clarity and pupil achievement. Teachers who present information clearly avoid vague terms, words or phrases which are unclear or lack assurance. They also have no or very few mazes, semantic problems such as false starts or halts in speech (Land 1979, pp.795). Clarity implies that the teacher emphasizes the content to be learned and clear transitions. A teacher needs to be able to define the concepts needed and indicate transitions between different parts of the lesson.

QUESTIONING LEVEL

The teacher is supposed to use different levels of questions in the classroom, low-order and high-order ones. In terms of Bloom's taxonomy, higher level questions correspond to application, analysis, synthesis, and evaluation while lower ones parallel knowledge and comprehension. In the performance area "Verbally Interactive" there exist many behaviors that deal with the teachers' questioning level. The use of higher order questions presents itself as one element of good questioning techniques. The research is not very consistent on this topic; different researches have suggested different conclusions. Some studies claim that the questioning level of the teachers made very little difference in student achievement (Winne 1979, pp.43). On the other hand the current research on effective teaching sees the need for more emphasis on the cognitive level of instruction in the classrooms (Tobin & Fraser 1991).

Stimulating

The performance area "Stimulating" includes teaching behaviors that describe the teacher with the attributes imaginative, stimulating, exciting, provocative, interesting, and avoiding dull routine. This performance area very much resembles Ryans's (1960) pattern Zo. Similar to the area Friendly, the performance area stimulating is more strongly related to affective than to cognitive outcomes.

ENTHUSIASM

Enthusiasm is one of the nouns stimulating teaching is usually described with. The teaching behaviors usually associated with enthusiasm are movement, gesture, and voice inflection (Westbury 1988, pp.143). The research indicates that enthusiasm frequently correlates with achievement among older students (Brophy & Good 1986). Secondary students have been found to achieve higher scores on immediate recall when mobility, gesture, and pausing were used (Wyckoff 1973). The research also suggests optimum levels (low, medium, high) of enthusiasm for different grade-levels (for example McKinney et al. 1983). The exact best levels of enthusiasm remain speculative, although a medium level of enthusiasm is tentatively recommended for elementary children (O'Neill 1988, pp. 168).

FLEXIBILITY

Flexible teaching behavior is one of the behaviors described in Harris's performance area stimulating. Flexibility can be defined for example to refer to teacher's potential "to meet the demands of the moment" and "to move with the shifting tides" (Hamachek 1975, pp.246) in (O'Neill 1988, pp.175).

This is among the teaching behaviors in DeTEK which is not strongly supported by the teaching effective research, but it appears in discussions on effective teaching behavior (O'Neill 1988, pp.175). However, the lack of support in the literature cannot be interpreted to demonstrate that flexibility would not contribute to effective teaching, as there simply has not been much research in the area. On the contrary, intuitively flexibility is an important asset for a good teacher.

Individually Oriented

The performance area "Individually Oriented" concentrates on teaching behaviors where the teacher treats each individual as a unique learner. Differentiation in assignments, materials and learning tasks are provided with intraclass groupings and total group instructions. In the recent review of research on effective teaching only the aspect of instructional mode has been discussed in the context of individualization (O'Neill 1988).

INSTRUCTIONAL MODE

Instructional mode can be defined in terms of teaching arrangements: individualized, small group, or large group (O'Neill 1988, pp.171). The research favors large group or whole class instruction because they allow more academically engaged time, which has proved to be one of the main predictors of students' successful achievement (Rosenshine & Berliner 1978). Some support for individualized instruction can be found especially in intermediate science classes (for example Anderson & Butts 1980 in O'Neill 1988, pp.171). The whole issue of differentiation in teaching is much debated in the literature, especially in the area of specialization for gifted children (for example: Feldhusen et al. 1989). However, it seems that an ability to maintain a proper balance between time-on-task behavior and individualized instruction is a clear indicator of an effective teacher.

Multi-Media Integrative

This performance area describes an ideal teacher as an individual who provides multi-sensory experiences to the students through diverse media.

VARIABILITY

In the recent review of effective teaching behaviors variability is defined by diversity in teaching behaviors, techniques, and strategies. Variability has not been studied extensively, but it appears frequently in the literature (for example Emmer et al. 1980, O'Neill 1988, pp.173-174).

Discussion

As we have seen, the teaching behaviors identified in the DeTEK model are very much in accord with the current research on effective teaching. The performance area "Businesslike" including teaching behaviors like time-on-task, teacher organization and classroom management skills, has especially strong support from the research. Similarly the verbal skills in the performance area "Verbally Interactive" are getting support from research especially in the area of clarity. The research approves a friendly, positive classroom climate with regular feedback from the teacher who avoids negative criticism. Harris's performance area "Friendly" has many teaching behaviors that describe a teacher who is capable of creating a warm atmosphere in the classroom.

There is evidence of the effectiveness of stimulating teaching behavior (Harris's performance area 4), but the appropriate level of teacher enthusiasm is under discussion. Individualized teaching can be justified in certain contexts but the evidence generally supports whole classroom teaching, where time-on-task can be maximized to all students. Harris's performance area Individually Oriented is defined more broadly than individualized teaching and emphasizes the need for every student to be treated as an unique learner. The use of multi-media in teaching can be supported by the need for variability, use of different teaching strategies and media to bring diversity to the classroom.

The knowledge of effective teaching research can be one of the resources for the teacher in reflecting his own teaching behavior. Basically the findings of this research suggest the need for teachers to have a varied repertoire of teaching strategies (Ross & Kyle 1987). In implementation of the research findings one must remember that there are variations in the ways teachers accomplish effectiveness, and not all the effective teachers need to "fit the profile" defined by the general trends in effective research.

The context of the studies has to be taken into consideration in the evaluation of the findings. Research has focused primarily on the learning of basic skills by low performing students in elementary grades (Doyle 1985, pp.31). Consequently these research findings do not necessarily apply to students at the other grade levels in other content domains.

The curriculum content is a very important factor in assessing effectiveness. It is quite possible for a teacher to emphasize the learning of facts and procedures that could be used to obtain correct answers to questions on tests and examinations. The work can be routine and require only little thinking with low cognitive demands. If the students are to learn the elements of scientific thinking and to plan and interpret their own investigations, this kind of teaching could not be considered as effective judged by the objectives. The current research on exemplary teachers has raised a question on the relationship between the stated objectives and the activities in which students are engaged. A dissonance between these two was found in assessing exemplary teachers in the Science and Mathematics Education study (Tobin & Fraser 1991).

5.2.4. THE MODIFIED VERSION OF DETEK'S SELF-EVALUATION INSTRUMENT

Our self-evaluation instrument consists of two parts: background information and the main evaluation against the DeTEK criteria using a scale from 1-6. The main evaluation part has 95 descriptions of teaching behaviors selected from the DeTEK criteria list (shown in Appendix 5). All the behavior statements for this part of the questionnaire were mixed together randomly including descriptions from all the levels of the original instrument: from the abstract main behaviors (e.g., 1,3,1a,2c) and from the indicators (e.g., 1a(2), 4c(3)) which describe the teacher behaviors in a very concrete way. For the gathering of Finnish data, the behaviors were translated directly into Finnish, though naturally in some of the cases the descriptions had to be slightly modified to fit the Finnish context. However, there are no essential differences in the descriptions from the original ones, except some divisions of disjunctive descriptions into several individual descriptions, together with the fact that some of the descriptions available were omitted to make the size of the instrument tractable.

The descriptions of teaching behaviors chosen represent all the six performance areas identified by Harris. In our instrument there are 14 (21)[2] behavior statements from performance area I (Businesslike), 22 (23) behavior descriptions from the performance area II (Friendly), 15 (14) from the performance area III (Verbally Interactive), 22(24) behavior statements from the area IV (Stimulating), 10 (21) from the area V (Individually Oriented) and 12 (19) behavior descriptions from performance area VI (Multi-Media Integrative). All the behaviors are presented in the context of classroom teaching. The teachers were given a scale from 1 to 6, and were asked to evaluate their classroom behaviors against the described statements using the given scale.

The background information includes information about the sex and age of the teacher, as well as how many years a teacher has been teaching, and are simply used to check and rule out uninteresting discriminating factors in the discriminant analysis. Both questionnaires are attached as an Appendix (Appendix 5).

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[2] The original number of statements in the DeTEK model is indicated in the parenthesis.

As usual, the instrument used has been specific to the study in question. Thus the only meaningful test for reliability was for the inter-item consistency of the instrument (Anastasi 1988, pp. 122-123). For multiple scored items the standard reliability test is Cronbach's alpha (Valkonen 1978, pp. 58), which gives us the reliability coefficient of the instrument. The alpha value for factors in the different data sets was high, on average .800. However, it is important to realize that in spite of such alpha scores there clearly are sources of error variance which could be revealed by a test-retest technique (Anastasi 1988, pp. 148-150). One source of error is the length of the instrument, since filling out such a long form is tedious and the scores given closer to the end of the instrument are more susceptible to error. This does not necessarily mean larger variance in the scores closer to the end (which could be tested), as a typical source of error is the extensive use of median values (in our case 3), a choice that is easiest for the teacher as it requires very little introspection.

Another source of error variance for the Finnish data is the low motivation of the teachers, especially for the subject-specific data (see discussion below). Low motivation produces more random “don't care” responses, which of course lower the reliability of the test. Such error variance is likely to be much reduced in the US data, where the teachers (due to the involvement of the superintendent) had a very high motivation to respond.

5.3. EVALUATION DATA

The summary of the descriptive statistics of the various data sets is illustrated in Figure 5.4. Below we will describe characteristics of each of the individual data sets and their selection methods.

5.3.1. THE US DATA

The US data was gathered from elementary teachers of two different states, Indiana and Texas. The reason for selecting these two states for our study was researcher's opportunity to live in both states and establish contacts with the local authorities whose help was necessary to get permission to survey the teachers. These two states are very interesting in many aspects. Texas always has had a unique character and differs from all the other states. The other state, Indiana is a typical mid-western state. From both states we aimed at getting as representative a sample from the local teachers as possible.

	Indiana N (%)	Texas N (%)	Kajaani N (%)	Helsinki N (%)	Subject specific N (%)	Total N (%)
Men	5 (6.5)	4 (4.4)	19 (30.6)	14 (28.6)	8 (13.1)	50 (14.7)
Women	72 (93.5)	86 (95.5)	43 (69.4)	35 (71.4)	51 (83.6)	287 (84.6)
Age <25	5 (6.5)	4 (4.4)	1 (1.6)	0 (0)	5 (8.2)	15 (4.4)
Age 25-34	15 (19.5)	27 (30)	22 (35.5)	18 (36.7)	15 (24.6)	97 (28.6)
Age 35-45	32 (41.6)	31 (34.4)	25 (40.3)	18 (36.7)	17 (27.9)	123 (36.3)
Age 46-55	19 (24.7)	20 (22.2)	11 (17.7)	10 (20.4)	14 (23.0)	74 (21.8)
Age >55	6 (7.8)	8 (8.9)	3 (4.8)	3 (6.1)	10 (16.4)	30 (8.8)
Exp. 1-5	20 (26)	20 (22.2)	13 (21)	15 (30.6)	14 (23)	82 (24.2)
Exp. 6-10	11 (14.3)	19 (21.1)	12 (19.4)	10 (20.4)	11 (18)	63 (18.6)
Exp 11-20	29 (37.7)	27 (30)	22 (35.5)	16 (32.7)	15 (24.6)	109 (32.2)
Exp >20	16 (20.8)	21 (23.3)	15 (24.2)	8 (16.3)	21 (34.4)	81 (23.9)

Figure 5.4: Descriptive statistics of the background variables.

From a cultural point of view the states selected will also reflect the difference between Southern and Northern states. Although not in the "deep South", Texas shares many features typical of the true Southern states: considerable racial minorities and a large number of inhabitants with English as a second language. Indiana has a mostly white population and is conservative with no clear candidate as a possible second language. However, the states also share notable similarities. Both are to great extent farming societies (Texas also having significant oil-related industry) and both have good higher education facilities (e.g., the University of Texas sites, Purdue University, Indiana University).

Texas as a state puts more emphasis on educational system development than Indiana with experimental schools and a well-developed teacher evaluation system. The pupil/teacher ratio is almost identical (Anon. 1992), while on the average in the SAT scores of the pupils there is similarly no statistically significant difference.

5.3.1.1. INDIANA DATA

In Indiana we selected one school district with different types of schools and students of varying sociological backgrounds. With the help of the superintendent of this district five elementary schools from the districts' total of 14 elementary schools were chosen to participate in the study.

Two of the schools surveyed are urban schools with large minority populations. The other two serve suburban, middle class areas, and one serves a small village and outlying rural area. The superintendent selected these schools because together they form a representative sample of the overall population of the school district. This school district has approximately 680 employed teachers of which about 340 are elementary school teachers and approximately 480 have tenure. The school district has an extensive inservice program which is conducted on a voluntary basis (with few exceptions).

The district uses a Master evaluation system. All the teachers are evaluated. During the first five years any teacher in the district's schools will be evaluated at the beginning of the year. Permanent teachers in each school will be evaluated on a three year cycle, as determined by school principals and approved by the respective Division Head.

A total of 100 questionnaires were sent to the principals of the schools chosen with an informative letter and directions for reply. The principals took care of the distribution and the collection of the questionnaires from the teachers. After receiving the questionnaires the principals sent them to the superintendent and finally he forwarded them to the researcher. A total 77 self-evaluation questionnaires from Indiana teachers was returned, which is a 77% answering rate, a very good result for a voluntary survey of this nature. Female teachers dominated the data, 72 questionnaires being answered by women (93.5%), and only 5 questionnaires (6.5 %) being completed by male teachers.

5.3.1.2. TEXAS DATA

The representative Texas data were gathered during fall 1991 and spring 1992 with the help of professor Harris from the University of Texas at Austin. A sample of teachers from three school districts represented central

Texan teachers. The schools in these districts were integrated, not wealthy, middle range communities.

One of these districts had a large black minority. All the schools in the district are racially mixed having 48% black, 27% hispanic and 25% white population. Of the students 75% receive federal free/reduced lunch assistance, and 50% of their elementary students are considered to be at risk of dropping out of school before graduation.[3] The questionnaires were distributed to nine elementary schools in the district with the help of the director of elementary education, who collected them and forwarded to the researcher. From the 50 questionnaires 43 (86%) were returned with extra information about the school district.

The other school district involved in the study had reasonably homogenous schools. The racial balance in the schools is 78% whites, 20% hispanic and only 2% black. Five voluntary schools participated in the study. With the help of the local superintendent the questionnaires were distributed to the schools and the superintendent forwarded them to the researcher. Of 40 questionnaires 25 (62.5%) were returned with some basic information about the school district.

The third school district in our study was a large predominantly white, school district with some of the best schools in Texas. The curriculum is good and progressive. Three schools were chosen to participate in the study by the superintendent. The surveys were received back only from two schools. Of a total of 60 questionnaires 22 (36.6%) were returned by the same method as previously.

All the school districts in the study were located in quite conservative, republican towns. Approximately 40% of the teachers had a master's degree. Together these three school districts represent Texas as a whole. A total of 90 self-evaluation questionnaires was returned from Texas, a 60% return rate. Male teachers were as uncommon as they were in the Indiana data, accounting only for 4 (4.4%) of the teachers. The number of female teachers was 86 (95.5%).

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[3] This determination is made by identifying characteristics such as above age for grade level, failure in one or more grades, failure to pass one or more sections of standardized achievement tests, below grade level reading ability.

5.3.2. THE FINNISH DATA

The Finnish data consists of three samples of evaluations done by elementary teachers.

5.3.2.1. KAJAANI DATA

One of these samples was gathered from the teachers in the Kajaani area, which is located in Northern Finland. The questionnaires were distributed to the teachers with the help of a local research assistant who visited the schools and informed the school principals of the purposes of the study. Participation in the study was voluntary and the response of the teachers was greatly influenced by the attitude of the principal to the study in hand. A total of 77 questionnaires was distributed to the five schools in Kajaani area, 42 of them being returned. After that the research assistant contacted five more schools and mailed questionnaires to those schools which had teachers willing to co-operate. Twenty more teachers responded and answered the questionnaire. The total of returned questionnaires from Kajaani area was 62 (80.5%). Of these self-evaluation questionnaires 19 were completed by male teachers, which is 30.6% of all the return evaluations and means that about 69% of the teachers in the Kajaani data are female.

5.3.2.2. HELSINKI DATA

The second sample of Finnish teachers consists of elementary teachers from Southern Finland close to Helsinki. With the help of an assistant from the Vantaa Further Education Institute approximately 70 questionnaires were distributed to the schools in Helsinki area with an informative letter about the study. Within a month 45 teachers from ten different schools had responded. After that 4 more teachers returned the questionnaire to the Further Education Institute so that the total of questionnaires from Helsinki area was 49 (70%). The percentage of male teachers in this sample was 28.6% and female teachers 71.4%.

These two sets of data were gathered during April and May 1992. The total of questionnaires received from Finnish elementary teachers was 111 which was not sufficient to compare the data with the data received from American teachers (N=167). In the preliminary phase of our analysis we analyzed the Finnish data by factor analysis to determine the underlying structures. This resulted in a 18 factor solution, which was the same solution we had in our previous study with the same instrument studying Finnish elementary teachers in the context of religious education (N=61) (Tirri 1991). The substructures of these two data greatly resembled each other and we combined the data together to form a larger sample of Finnish teachers (N=172).

5.3.2.3. SUBJECT SPECIFIC DATA

In spite of the similarity in the underlying structures indicated by the factor analysis, it is clear that there are differences between these two data. The data for the previous study was gathered in Spring 1988 from a random sample of teachers from ten different schools in Espoo. Only the teachers who were teaching or had been teaching religious education answered the questionnaire in the context of this subject. The study used the same instrument but the context was subject specific. We find it interesting to analyze whether this difference in the context of evaluating the teaching practices makes any difference in the evaluations done by Finnish teachers. This question will be addressed later in Chapter 7 where the different groups of teachers are compared by performing a discriminant analysis for the complete data set.

Another major difference between these two samples was the different instructions the teachers were given for rating themselves. In the subject-specific study the self-evaluation scale was a forced distribution scale limiting the number of times each grade (ranging from 1 to 6) could be used. The reason for using a forced distribution scale was to reduce ratings that are either too favorable or too adverse. While pretesting the instrument in a small group of religious education teachers from different schools, we found the teachers to be biased in rating themselves very high in every teaching behavior. As the underlying assumption in the developmental approach is that every teacher can improve his teaching in some area, it is important to identify weak areas; i.e., areas that are not mastered as well as the others.

The idea of using a forced distribution scale in a previous study did not turn out to be a good choice. The teachers had a very negative attitude towards this structure, stating that it forced them to give an inaccurate picture of their teaching behavior. Many teachers refused to answer the questionnaire for this reason and those who answered did not necessarily answer according to the instructions anyway. For these reasons we changed the response instructions in this study by omitting the forced distribution scale and only encouraged the teachers to use the whole scale.

The total of self-evaluation questionnaires from teachers for this subject-specific data returned was 61, which was only a 50% response rate. The reasons for the low return percentage are discussed in details in our previous study (Tirri 1991, pp.90-91). In this sample the number of male teachers was 8 (13.1%) and 51 (83.6 %) of the teachers were female. In two of the questionnaires the sex of the teacher was left unspecified. Most teachers were middle-aged, belonging to the age category of 35-55 years. The teachers in this sample had the most teaching experience, 33.4% of the teachers belonging to the category of more than 20 years.

5.4. THE ANALYSIS METHODS

Choosing appropriate analysis methods is usually a problem with degree of difficulty second only to acquiring the proper data. The choice of suitable analysis methods are guided by our focus of interest; namely correlation between the different variables representing the behavior criteria of the underlying model, and grouping of these variables into more abstract concepts, performance areas, to form a model. Thus factor analysis is a natural choice for inclusion in the set of analysis methods to be used. Selecting factor analysis over "plain" principal component analysis (Harman 1976) is nowadays more common due to the increased possibility of relating results to earlier factor analytic studies.

Our need to compare the structures produced by an explorative factor analysis leads us to use factor structure comparison methods, for which we have chosen the projection method of Kaiser, Hunka and Bianchini (Kaiser et al 1971). Finally, for a more rigorous study of cross-culturality as a discriminating factor we have resorted to discriminant analysis (Klecka 1981). The empirical design of the research is illustrated in Figure 5.5. All the analyses, with the notable exception of factor structure comparison were performed with the SPSSX VAX VMS version 4.1. For the factor structure comparison we used the recent FACTREL program by Fleming (1992).

Although details of using each of the methods are reported when applied, we find it useful here to discuss below some of the general principles used in throughout our empirical study.

First of all, although the distributions of the measurements scores was far from normal, in the analysis phases the data has not been normalized (see for example discussion on normalization using standard constructions such as Fisher's Z-points in Komulainen & Karma 1992, pp. 62). Performing the normalization and checking the results revealed the results to be a two-valued scale which would have collapsed the detailed variance information as well as prohibited us from performing a meaningful discriminant analysis.

As stated in the beginning of this Chapter (Section 5.1.) our empirical focus is twofold. In the first phase we concentrate on an attempt to fit the Harris six component model to the data gathered from the USA and Finland. After a brief look at the elementary statistical indicators (means and standard deviations) an obvious step in assessing the structure fit is to proceed by factor analysis. Here we are facing a methodologically interesting situation. We have a reasonably well-defined model whose validity could in theory be tested with a confirmatory factor analysis (Jöreskog 1969). In such an analysis the space of possible loading matrices will be constrained by fixing some of the loadings to constants (Leskinen 1987), and the nature of confirmatory factor analysis would satisfy our hypothesis testing requirement. Unfortunately in practice the high dimensionality of our data (95 variables, expected number of primary factors 18[4]) prohibits us from using methods such as LISREL (Jöreskog & Sörbom 1976) due to computational restrictions and the limited sample size (Leskinen 1992). Consequently we will perform a forced (six factor) factor analysis on the data sets, and relate the structures identified to the Harris model by comparing the corresponding variable sets. Although not as accurate as using "true" confirmatory models, such visual inspection gives us valuable information about the differences in the degree of fit between the US and Finnish data.

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[4] The number of primary factors could be estimated from the previous study (Tirri 1991) where the same instrument was used for the subject-specific data of the current study. The assumption of the complex substructure of the Harris six component model was also supported by the properties of the method which Harris used to construct the model (see discussion in (Tirri 1991))

From our theoretical setting we have two essential pieces of information. The first one, the expected number of latent variables, relates to the discussion above about confirmatory factor analysis. The second one, the existence of correlation between the latent variables, influences our choice of rotation method for factor analysis. The use of the combination of the principal axis method for factor extraction and the varimax (orthogonal) method for rotation seems to have become a de facto standard in the educational research (Leskinen 1987, pp. 54). However, as mentioned by Leskinen and Kuusinen, in many cases the use of oblique rotations, could have produced significantly different results (Leskinen & Kuusinen 1991). This is not surprising if one realizes that in many cases the underlying dimensions are clearly correlated already because of the theoretical framework, and thus an orthogonal rotation will be able to find only artifacts; i.e., approximations to the true structures. In our case the latent variables representing the various dimensions of effective teaching are naturally all highly correlated, and thus to achieve the simplest interpretation structure the use of direct oblimin rotation (Harman 1976, pp. 334-341) is more appropriate than varimax solutions. Following Harman's recommendation (Harman 1976), we have kept the SPSSX default value of the extent of obliqueness ($\delta = 0$) for all of the analyses.

Although the visual inspection for the forced factor solutions did not result in a very good match, this does not give us much more information beyond the simple fact that a trivial one-to-one match is unlikely. Even if the underlying structures in the data are similar to the Harris model components, underfactoring tends to distort the results. Hence from the initial attempt to compare Harris's model and the forced factor solutions we have proceeded by performing a unconstrained exploratory factor analysis for each of the data sets.

Any exploratory analysis has to be preceded by observations relating to the appropriateness of its use. Consequently we have tested both the hypothesis that the correlation matrices in question are identity matrices (Bartlett's test of sphericity) and the relationships of observed correlation coefficients to the magnitudes of the partial correlation coefficients (the Kaiser-Meyer-Olkin measure). In both of these respects the correlation matrices seem to satisfy the requirements for factor analysis extremely well. The Bartlett sphericity test values ranged from about 10000 to 21000 with 0 significance level, and the KMO values from .81 to .95 for the whole of the data, values which Kaiser (1974) characterizes as meritorious or marvelous.

One of the central issues in exploratory analysis is the question of deciding the right number of factors; i.e., when to stop factoring. There exist formal tests such as Bartlett's test based on chi-square approximations (Bartlett 1950), but one should remember that these tests only provide an upper bound for the number of factors that can be of practical significance. One has to remember that a statistical test of significance only indicates the existence of factors, but not necessarily ones that are identifiable in the semantic framework studied. In our case the commonly used crude guideline of latent root curve criterion; i.e., the "scree" of Cattell (Cattel 1978, pp.76-91) clearly underestimates the number of factors. Thus as a numeric guideline to choose the proper number of factors we have used the "variance greater than 1.0" rule (Kaiser 1970, pp. 401-415), which is the default in SPSSX software. However, in the case of the US data this criteria would have indicated a smaller number than for the Finnish data set (18 vs. 15). Hence for comparison purposes we chose the 18 factor solution for the US data as well, since it too had a clear interpretation. In general, the most important factor influencing the choices has been the simplicity of interpretation.

As mentioned earlier, using the above criteria typically lead to the discovery of 18 primary factors. As Harris's model clearly is one with higher order composite factors, for comparison purposes we also performed second order factorization with factor scores as representatives of the primary factors. For calculating factor scores we chose the regression method over the Anderson-Rubin method as the latter always produces non-correlated scores even in the case where the original factors are estimated to be correlated. For these second order factors we performed a visual inspection against the Harris model components, but in this case the structures themselves also had a value of their own.

For further inspection of the effects of cross-culturality we compared the relationship of the two primary factor structures. Instead of simply calculating the coefficient of congruence (Harman 1976, pp. 256-260) we have used the projection method of Kaiser, Hunka and Bianchini (Kaiser et al 1971), a method resembling transformation analysis (Ahmavaara 1954). We have chosen the Kaiser, Hunka and Bianchini approach, as the computational procedure is also suitable for studying the oblique solutions on which the previous analysis phases are based. For the analysis we used very recent FACTREL software (Fleming 1992). Since the use of this method has been rare in the educational literature, it is discussed in more detail in Section 7.6.

In the final phase of the analysis (see Figure 5.5.) we performed a discriminant analysis for the complete data set in order to identify discriminating factors from the primary factor structure identified. Instead of just investigating discrimination between American and Finnish teachers, the analysis was carried slightly further and attempted to discover discriminators for the geographical and subject-specific dimensions also. The "quality" of the discriminating functions discovered was checked using the standard indicators such as Wilks's lambda and η squared (Klecka 1981).

One final issue related to reporting the statistical analysis involved in this study. The large size of the correlation matrices and related tables (typically over 5000 figures each) prohibits reproducing the documents here. An exception is the FACTREL listings for Section 7.6 which are presented in full. The interested reader may request the computer listings from the author.

5.5. ON VALIDITY

The validity of an empirical test concerns what the test measures and how accurately it achieves its goal. Fundamentally, determining test validity is concerned with relating test results to other independently observable facts about the issue under consideration (see discussion in Anastasi 1988, pp. 139-140). Validity of a measurement is always relative to the concept of interest; thus we will first discuss the motivation of our measurements, comparing the theoretical model of effective teaching by Harris to the structures implied by the cross-cultural data gathered. In this respect our study is connected to the much debated notion of construct validation (Cronbach & Meehl 1955, Cronbach 1989). Quoting Anastasi (Anastasi 1988, pp. 161):

> "Because construct validity is a broad and complex concept, it has not always been clearly understood by those who employed the term."

For our purposes the abstract discussion of general issues related to construct validity reduces to the (in principle) simple question of finding positive or negative evidence in our data for the existence a theoretical artifact, Harris's model of effective teaching.

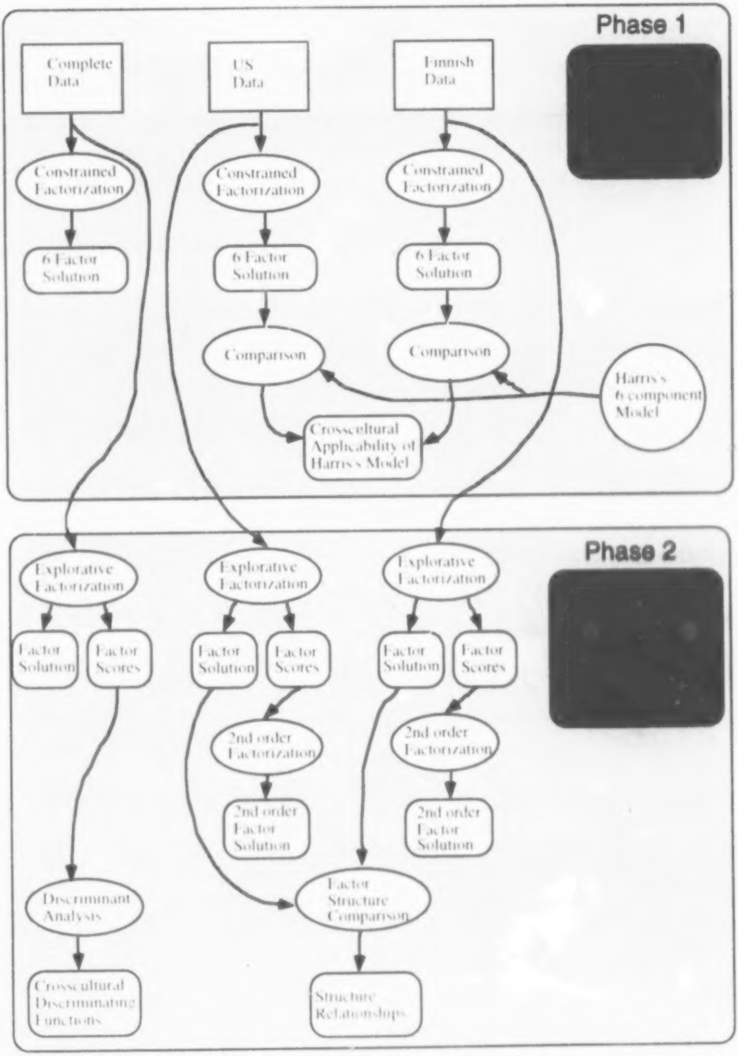
Phase 1
Complete Data
US Data
Finnish Data
Constrained Factorization
Constrained Factorization
Constrained Factorization
6 Factor Solution
6 Factor Solution
6 Factor Solution
Comparison
Comparison
Harris's 6 component Model
Crosscultural Applicability of Harris's Model
Phase 2
Explorative Factorization
Explorative Factorization
Explorative Factorization
Factor Solution
Factor Scores
Factor Solution
Factor Scores
Factor Solution
Factor Scores
2nd order Factorization
2nd order Factorization
2nd order Factor Solution
2nd order Factor Solution
Discriminant Analysis
Factor Structure Comparison
Crosscultural Discriminating Functions
Structure Relationships

Figure 5.5 The empirical design of the research

To begin with, one needs to clarify what is meant by "comparison". According to (Raivola 1984) The Oxford English Dictionary defines the term

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as follows: "the action, or an act, of comparing or likening, or representing as similar". Such a definition gives an opportunity to interpret comparison as a classification, which is made by the observer. In comparative research the theory and hypotheses form the dimension of comparison, not the raw data itself (Raivola 1986, pp. 270). In our context this means that we have adopted a working hypothesis, a particular model of effective teaching that tells us what to look for in the data, namely the performance areas. We compare the artifacts of the Harris model to similar artifacts present in data, to find the degree of match. And because of the existence of cross-cultural data we can go further than this, comparing the match between the theory and data in different cultures.

However, when comparing measurements from different cultures the central problem always reduces to the same fundamental question of whether it is at all possible to scientifically compare measurements from different social and/or cultural systems and its units? To illustrate the problems applicable to our study we briefly point out here some generic issues with concrete examples. Needless to say, all of these aspects also affect the validity of our comparison task.

- Do the concepts being compared correspond? Are they similarly situated on the general-specific continuum? For example, we need to relate qualifying concepts such as "first level education" from different cultures. According to the Unesco Statistics yearbook (Anon. 1988) the term "first level" denotes grades 1-6 in Finland, but in US it also includes Kindergarten class (from K to 6th grade). Although in our case this does not have any substantial influence on the test situation, differences like this make drawing proper conclusions a very delicate task.

- How is the correspondence of measurements to be assessed? Do the indicators given to concepts correspond to each other? Or is it the case that although the definitions are identical, their semantics are different in different contexts? For example variable 5 "I accept disagreements" is evidently understood differently among the Finnish teachers than their American colleagues.

- How easily can the concepts be identified? A theoretically perfectly clear concept may present operational and linguistic difficulties in its

> formulation. For example translating the variable "I am an exciting teacher" as "Olen jännittävä opettaja" is not a semantically equivalent translation, but cannot easily be improved either.
>
> Can the problem of how concepts are linguistically expressed be resolved? Different cultures verbalize different aspects of the same concepts. It has become customary to use bilingual or multilingual experts and repeated translation back and forth until unclear points are eliminated (Raivola 1986, pp.267-268). In the case of an academic thesis such as ours, the cost of using experts is prohibitive.

The conceptual and operational difficulties above have led many researchers to suggest that only very similar phenomena and structures can be compared. In this view the problem of comparative research could be defined as how to find a body of material suitable for comparison which is independent of the collector and interpreter. This view assumes that objective data for comparison are somewhere in existence just waiting to be gathered. Raivola (1986, pp. 268-269) argues that such a view evidently confuses concepts with empirical phenomena which are directly observable and with variables derived from them. He claims that concepts are generalizations and abstractions from what is empirically observed, and these have meaning only in the context of a theory.

On the other hand Farrell argues that the problem of data comparability is a non-issue. He defines similarity as a relationship between the observer and the data, one that depends on the observer's system of concepts (Farrell 1986, pp. 201-214), so that a working hypothesis to tell one what to look for is necessary. This pre-understanding generates assumptions and suppositions that form research hypotheses. This leads Raivola to conclude that the notions of sameness or difference are relative, as described in the following quote:

> "In his conclusion, the observer either accepts or rejects a hypothesis of correspondence between the phenomena under comparison. Sameness and difference are thus relative concepts. In principle, there are no phenomena too different to be compared, because the presentation of such a claim implies that some dimension of comparison has already been tried." (Raivola 1986, pp.273).

In spite of the all the listed difficulties of cross-cultural comparisons, the importance of such an endeavor is commonly agreed upon. Farrell argues that every proposition regarding education or human behavior generally ultimately requires cross-national treatment (Farrell 1986, pp. 207).

Comparative data are essential to establishing the credibility of our theories, and hence of our explanations. Without them there cannot be adequate explanation. There can be no generalizing scientific study of education which is not the comparative study of education (Farrell 1986, pp. 207-208). Similarly, Noah stresses:

> "Cross-cultural study of education can identify the potentials and the limits of international borrowing and adaptation. A comparative approach enlarges the framework within which we can view the results obtained in a single country by providing counter instances, it challenges us to refine our theories and test their validity against the reality of different societies, and by providing parallel results, it can yield important confirmation of results obtained elsewhere" (Noah 1986, pp.153-165).

According to Pfau (1986) the reasons for making cross-cultural comparison of classroom behaviors include determination of the generality of classroom-related theory, generation and testing of such theory, the identification of variability across cultures to obtain otherwise unavailable experimental treatments, and the provision of information about classroom occurrences to educational planners, evaluators and others. Such reasoning is based on the view that generality of theory across cultural boundaries is to be sought by researchers and that quantitative methods may be used as a tool to help develop and test such theory (Pfau 1986, pp.293).

There exist several methodological issues that effect the validity of a cross-cultural comparison such as ours. The data about classroom activities can be gathered either via direct (narratives, rating systems) or indirect techniques, both of which present problems in test validity. Since we have used indirect techniques, we focus on their specific problems.

Indirect techniques such as questionnaires and interviews have been used in IEA studies. The extent to which such reports are veridical (that is, they reflect actual teaching practices) is an open question (Pfau 1986, pp. 295). Serious questions can be raised about the validity of inferences drawn from the use of such measures. For example, does the term "frequently" mean the same thing to a British teacher and to an Indian teacher, and thus are the responses given by such teachers actually comparable? (Pfau 1986, pp. 294). In addition, issues such as response bias operate – in other words, some countries are freer with their willingness to emphasize (anything) than others. Similarly teachers may be poor perceivers of their own performance. Consequently their reports do not reflect the reality of their teaching. What the respondents report might represent their values rather than their practices.

Closely related to this bias problem are the general constituents of distortion for any self-evaluation test: limited evaluation, conforming to socially acceptable behavior and situational aspects (Anastasi 1988). Limited evaluation takes place when a person presents answers referring to attitudes or observations he himself does not have. This occurs when a person, deliberately or not, limits what he is willing or able to reveal of himself. Reasons for such behavior can be found from personality features such as shyness, good manners or limited introspection. Conforming to socially acceptable behavior takes place when the respondent presents views he does not hold. The test situation itself can also be a learning opportunity, in which case the respondent produces new opinions on the test occasion.

Situational aspects such as difficulties in understanding the rating instrument or the level of fatigue can affect the validity. Since we have used a self-evaluation questionnaire, all the above facets also affect the validity of our approach. For example in our case it is very clear that our study is affected by the tendency of American teachers to be too lenient in their ratings. Similarly the length of the questionnaire, which also affected the instrument's reliability, has an effect on the internal validity; i.e., statistical conclusion validity. In addition, since the persons who gave the questionnaires to the teachers were not able to control the response situation, situational aspects such as the lack of opportunity to correct misunderstandings or improve the motivation of the respondents lowers the validity. In our case preliminary analysis of the data revealed problems for 6 of the variables used in the instrument (variables 43, 71, 78, 84, 85 and 103). These problems were either related to translation issues or other oversights in the questionnaire construction. Such variables were omitted from the analyses performed.

One methodological aspect we have is associated with the general characteristics of rating systems. Kerlinger claims that any rating system has an intrinsic defect – its proneness to constant or biased error. Such defects are relevant to self-rating also and thus applicable to our context. In general for rating systems, in addition to halo effects, which are difficult to avoid, the following three types of error are often associated with rating scales: the error of severity, ("a general tendency to rate all individuals too low on all characteristics"), the error of leniency, (an "opposite tendency to rate too high"), and the error of central tendency, (a "general tendency to avoid all extreme judgments and rate right down the middle of a rating scale")

(Kerlinger 1973, pp.548-549). In the questionnaire used for subject-specific data there was an attempt to eliminate these tendencies by a forced distribution scale, but that particular feature was very much criticized by the respondents, and thus was dropped from the further questionnaires.

The problems with ratings in a cross-cultural setting are even more severe. When different recording biases occur in persons with different cultural backgrounds, the utility of rating systems for making cross-cultural comparisons can be seriously undermined. If one adds to such biases the difficulty of providing operational definitions of the high-inference concepts used in most rating systems and the very real possibility that points on the rating scale may mean different things to observers from different cultures, studies with rating systems may obviously result in judgments that are unreliable as well as biased. (Pfau 1986, pp. 297).

As discussed earlier, our work can be seen as a study of issues relating to the construct validity of the Harris model of effective teaching. To demonstrate construct validity one should focus both on convergent and discriminant validation (Anastasi 1988, pp. 156-158, Moss 1992, pp. 233). For convergent validity one has to show that a particular test (behavior description in our case) correlates highly with variables with which it should theoretically correlate. For discriminating validity one attempts to show that the test does not correlate significantly with variables from which it should differ. If a test is both convergently and discriminantly valid, it is highly selective and measures one structure only. In our case we are able to test convergent validity; i.e., the intercorrelation of the variables within a Harris performance area. However, since it is already evident from the theoretical background that the different model components (performance areas) correlate with each other, we cannot hope to achieve discriminating behavior even in theory.

Chapter 6

CROSS-CULTURAL VALIDITY OF THE HARRIS MODEL

6.1. THE GENERAL APPROACH

In this Chapter we will investigate the cross-cultural validity of the Harris model discussed in Chapter 5. As indicated earlier, the model was based on an abstract 6 component structure, for which Harris identified about 100 behavior descriptions. Theoretical analysis leads us to expect a cultural bias in such a model. This bias is due to the sociological and historical differences in the societies, which necessarily affect the teaching practice also. Intuitively one would expect that the Harris model structure is more readily applicable to the American classroom environment than to the Finnish teaching process, since they clearly differ in their tradition. In Finland the teacher education has adopted features from both American and German traditions (the differences between these two traditions and their influence on Finnish teacher education is discussed in (Kansanen 1990)). Therefore we will first search for indications of the existence of Harris's theoretical structures in our data.

First we will analyze the two basic statistical indicators, mean and standard deviation for all the three data sets: the complete data, the US data and the Finnish data. Such an analysis gives an indication, although at a very coarse level, of the relative statistical differences of the data sets with respect to the Harris model components. However, such inspection does not reveal any information about the structural differences; consequently we progress to a factor analytic study for all these data sets. In such a study we seek to match the dimensions revealed by the statistical analysis to Harris's abstract structures. The purpose of this analysis is to reveal structural differences (with respect to the Harris model components), if any, between the different data sets.

The Harris model proposes an underlying 6 component structure. Therefore we have adopted a somewhat unorthodox approach, where we constrain the factor analytic search space by requiring the solution to have exactly 6 components, without justifying this number by any of the standard rules of thumb (such as the scree-test). From the methodological point of view, it is well-known that extracting and rotating too few or too many factors can distort the factor structure.

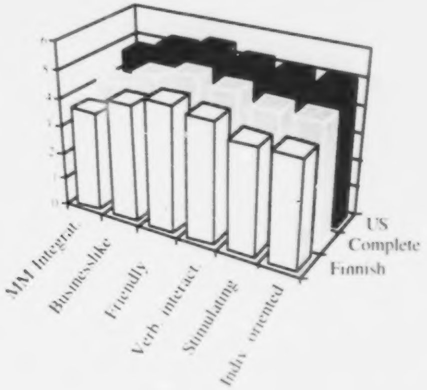

Figure 6.1. Means of the Harris model components. The dark shaded columns represent the US data, the white columns the Finnish data and the lightly shaded pattern the complete data

It is interesting to observe that in the methodological literature there is a lack of agreement about which distortion is worse, the one caused by over-factoring or the one caused by under-factoring (see discussion for instance in Rummel 1970, pp. 365). One of the crucial issues in an exploratory factor analysis is the estimate of the number of factors proper for the underlying abstract structure. However, in the case of the discussion in this chapter the issue is irrelevant as our investigation here is confirmatory - we are testing whether the suggested Harris model structure can be detected in the data, and thus "know" the right number of factors if such a structure really models the data. We will return to this issue of choosing the right number of factors in the context of the explorative factor analysis (Chapter 7).

6.2. DIFFERENCES IN THE BASIC STATISTICAL INDICATORS

Each of the Harris model components is represented by a group of variables. Therefore to study the means and standard deviations of these components one has to calculate the average values of the corresponding variables. Figures 6.1 and 6.2 depict the histograms of the means and standard deviations for all the three data sets: the complete data, the US data and the Finnish data.

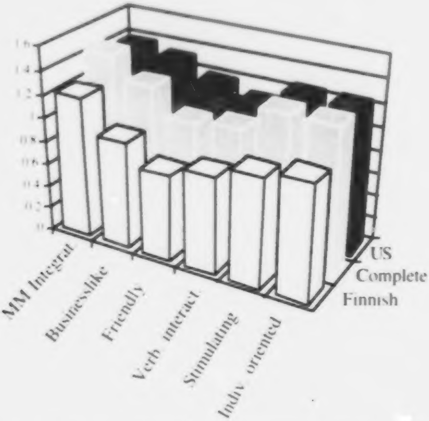

Figure 6.2. Means of the standard deviations for each of the Harris model components.

When inspecting the histograms one should be careful to look at the shape of the distributions only, not the absolute values obtained. The differences in the absolute values are indications of the differences in the teachers' self-evaluation rating behavior, not differences with respect to the Harris model. However, these values reveal the predictable observation that a Finnish teacher tends to rate himself generally with lower grades than his American counterpart for each of the components, and that the absolute standard deviation for American teachers is smaller in all cases. This sociological phenomenon is related to the cultural difference in the emphasis on self-esteem that tends to be very high for American teachers (Bennett 1990, pp. 51-52).

If one assumes that there are cultural differences in applying the Harris model, they should be reflected as variations of the distribution shape. This is due to the fact that the more the Harris model deviates from being an appropriate underlying theoretical construct for the data set, the more the component variables get confused with variables of the other components. In such cases the co-correlation behavior for the mean and standard deviation should break down and one would expect to see very distinct distribution shapes. Naturally the differences in the shapes can only be detected if the statistical indicator values have variance across the components, which clearly is the situation in the case at hand.

However, looking at the shape of the distributions it is evident that such a shape discrepancy cannot be seen, the shapes of the distributions for both the mean and the standard deviation being remarkably similar for the US and the Finnish data (which naturally implies the same shape for the complete set). Though such a similarity can also be a result of a random coincidence, clearly one cannot get any confirmatory evidence for the hypothesis of the cultural dependency of the Harris model at this elementary statistical indicator level. Therefore we will proceed to comparison of the abstract dimensions of the data sets.

6.3. THE FACTOR STRUCTURE FOR THE COMPLETE DATA

The forced 6 factor solution for the complete data explained 49.1%[5] of the variance. This indicates under-factoring as expected (see the discussion above). In this case clear interpretation of the factors was hindered by several facts. First, one of the factors (factor 5) was very small; i.e., had very few variables with high loadings. Second, in general if under-factoring occurs, it tends to cluster only marginally related variables together, a fact which naturally presents itself as difficulties in naming such factors. In the following we will give a brief description of each of the factors, and discuss the basis for the factor naming. To illustrate the match between the Harris model and the factor solution, we also show the distribution of the variables with high loadings with respect to the six original Harris model components. As will be seen, we will encounter various different degrees of matching from the wide spectrum of factors representing a balanced mixture of the components to cases where the factor represents a clear subcomponent of the original Harris model component.

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[5] The percentage values reported here and below are taken from the unrotated factor solution and thus do not reflect accurate values for the oblique solution. They are reported here to give reader an approximate idea of how much variance the factors explain. Due to the correlations in the oblique solution the true variance accounted cannot be computed from the colum sum of squared loadings as in the case of orthogonal rotations (Rummel 1970, pp.389).

FACTOR 1 "STIMULATING"	
NUMBER OF HIGH LOADING VARIABLES	19
HIGHEST LOADING VARIABLE	VAR 49, LOADING .698
PERCENTAGE OF VARIANCE EXPLAINED	36.9
NAMING BASED ON	HIGHEST LOADING

The factor had a total of 19 meaningful loadings. The highest loading for this factor was variable 49 "I am a stimulating teacher" (.698). The variables 82 "I am an exciting teacher" (.684), variable 65 "I am an interesting teacher" (.652) and variable 47 "I am an imaginative teacher" (.618) all correlated with each other. All these variables describe the same underlying concept of stimulating teaching behavior. Thus the factor was named "Stimulating" according to the highest loading variable. The other behaviors with high loadings for this factor, such as variable 92 "I utilize teacher-made as well as commercial and student-made materials in the classroom" (.695) and variable 48 "I use a variety of audio-visual and manipulative aids regularly as integral parts of lessons and assignments" (.678) can be interpreted as techniques supporting stimulating teaching.

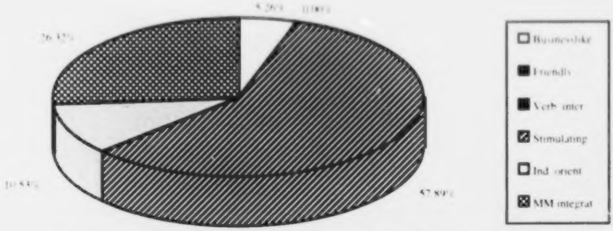


Figure 6.3. Distribution of the variables with high loadings in the complete data factor 1 "Stimulating" into the Harris model components. The pie chart should be interpreted as follows: 57.89% of all the variables with high loadings belonged to the Harris component "Stimulating", 26.32% to the Harris component "Multi-Media Integrative" etc.

Inspection of the variable distribution with respect to the Harris model components indicates that this factor indeed seems to be related to the Harris component "Stimulating". This connection is not clear for two reasons: the factor has a reasonably high portion of variables from the component "Multi-Media Integrative" (26.32%) and secondly, factor 3 also has a significant number of the variables from the "Stimulating" component. However, this factor (as well as the next one) is one of the better matching factors from the factor structure.

FACTOR 2 "PERSONAL"	
NUMBER OF HIGH LOADING VARIABLES	24
HIGHEST LOADING VARIABLE	VAR 41, LOADING .735
PERCENTAGE OF VARIANCE EXPLAINED	4.3
NAMING BASED ON	SUMMARIZING

This large factor had 24 loadings. The highest loading variable was 41 "I am a personal teacher" (.735). The factor was named according to this variable, since the other high loadings supported this interpretation. The adjectives warm (variable 24 with loading .601), outgoing (variable 28, .663), empathetic (variable 33, .706) and encouraging (variable 8, .600) are all related to the adjective "personal" and had high loadings in this factor. The factor had several variables describing personal teaching behavior, for example variable 25 "I express interest in individuals as persons over and above being students" (.670) and variable 64 "I share personal experiences" (.624).

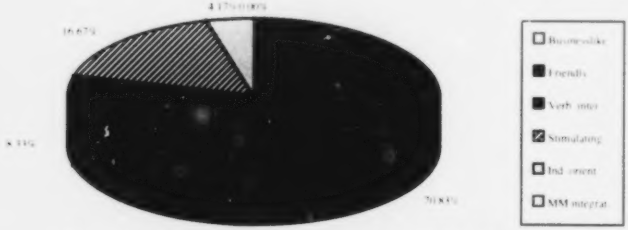


Figure 6.4. Distribution of the variables with high loadings in the complete data factor 2 "Personal" into the Harris model components.

The factor included behaviors of outgoing friendliness like smiling, laughing (variable 38, .666) and also nonverbal friendliness like "I demonstrate interest and concern for students nonverbally in a variety of ways" (variable 52, .680). All these behaviors can be interpreted as evidence of a goal of having personal interaction with the students. Inspection of the variable distribution with respect to the Harris model components indicates that this factor is indeed related to the Harris component "Friendly". However, this factor reflects only one facet of the general notion of a "friendly teacher" originally present in the Harris structure, namely the emphasis on using teacher personality in teaching interaction.

FACTOR 3 "STUDENTS' INTERESTS INCORPORATIVE"	
NUMBER OF HIGH LOADING VARIABLES	21
HIGHEST LOADING VARIABLE	VAR 68, LOADING .676
PERCENTAGE OF VARIANCE EXPLAINED	2.7
NAMING BASED ON	SUMMARIZING

The factor has a total of 21 variables with high loadings. The highest loading for this factor was variable 68 "I provide students with choices in topics for study, in activities, or in coworkers" (.676). The other high loading variables had the same emphasis, students' interests, thus supporting the naming of this factor. The second highest loading variables for this factor were variables 55 "I listen to students' ideas, incorporating them into the lesson and recognizing their worth " (.664) and variable 90 "I arrange for laboratory experiments, special projects, or action research studies as a part of regular assignments " (.664).

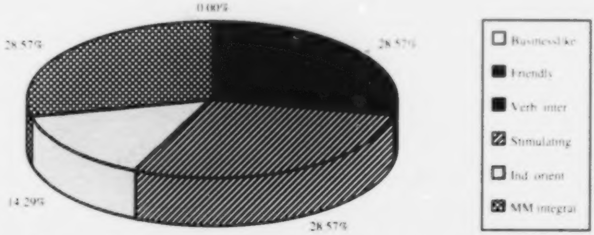


Figure 6.5. Distribution of the variables with high loadings in the complete data factor 3 "Students' Interests Incorporative" into the Harris model components.

The factor also had many other high loading variables which described the use of different activities, e.g., variable 87 "I structure discussion groups to provide extended opportunities for students to verbalize and share knowledge with each other" (.663) and variable 91 "I direct students in using role-plays or socio-dramas in connection with their assignments" (.640). The use of different activities can be interpreted as one source in considering the interests of different students and giving them choices in their learning.

With respect to the Harris model components this factor is a balanced mixture of the components "Verbally Interactive", "Multi-Media Integrative", "Stimulating", and "Individually Oriented". This actually supports the observation already discussed in (Tirri 1991) that it is easy to suggest orthogonal components in the original Harris component model with the same abstraction level. The notion of incorporating students' interests exhibits parts of the behavior of a stimulating teacher, as well as friendliness or individual orientation.

FACTOR 4 "TIME-ON-TASK"	
NUMBER OF HIGH LOADING VARIABLES	14
HIGHEST LOADING VARIABLE	VAR 42, LOADING .700
PERCENTAGE OF VARIANCE EXPLAINED	2.0
NAMING BASED ON	SUMMARIZING

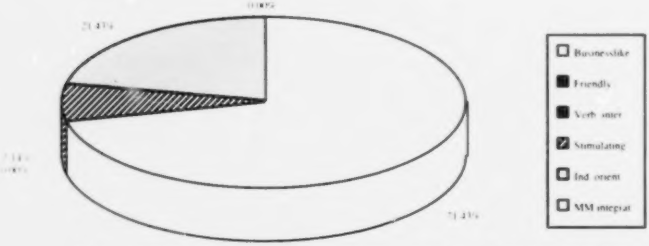


Figure 6.6. Distribution of the variables with high loadings in the complete data factor 4 "Time-On-task" into the Harris model components.

The factor had 14 meaningful variable loadings. Several of the high loadings described the efforts to meet the needs of individual students. The highest loading variable for this factor was 42 "I arrange for students to work in small groups" (.700). The next highest loadings were on variable 80 "I lead students in checking and correcting their own work diagnostically" (.666) and variable 14 "I arrange for students to work individually" (.627). The factor had many variables describing different ways of helping the students to meet the tasks demanded in the classroom. To make it possible for every student to meet these requirements it is necessary to use a variety of teaching activities suitable for the students in question; e.g., variable 10 "I initiate changes in activity for individuals who are ready while others are still busy with prior assignments" (.619). Sometimes the students can help each other to meet the demands as in variable 6 "I encourage and direct students in assisting each other to assure task completion" (.622). All these efforts can be interpreted as attempts to individualize teaching to help to keep the students on task and accomplish the given goals. For this reason the factor is named "Time-On-Task".

With respect to the Harris model components this factor is clearly a subcomponent of the abstract notion of "Businesslike" teaching. Maintaining schedules requires not only ability to keep order in the teaching interaction, but also adaptive ability to take into account the various rates students are able to absorb the teaching material. This latter facet of businesslike teaching is reflected in this factor.

FACTOR 5 "POSITIVELY ORGANIZED"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 98 LOADING .601
PERCENTAGE OF VARIANCE EXPLAINED	1.8
NAMING BASED ON	SUMMARIZING

This factor was very small with only four variables with high loadings. The highest loading for this factor was variable 98 "I organize materials and resources for student use so that individual learners have what they need when they need it" (.601). The second highest loading variable 94 "I arrange all materials for easy distribution as needed during activity" (.579) had the same emphasis on organizing the materials for classroom use. The other two variables in this factor described the teacher as warm variable 99 "I reflect empathy, concern, and warm liking of students as related to both school and other aspects of life" (.569)) and avoiding negative atmosphere in the classroom variable 96 "I avoid directions or comments which disrupt students" (.568). Combining the features present in both variable pairs resulted in the factor being named "Positively Organized".

With respect to matching to the Harris model components this factor is clearly too small to be meaningfully interpreted. The possibility of matching is further hindered by the fact that all of the variables with high loadings belong to different Harris components.

FACTOR 6 "CLARITY OF COMMUNICATION"	
NUMBER OF HIGH LOADING VARIABLES	11
HIGHEST LOADING VARIABLE	VAR 36 LOADING .756
PERCENTAGE OF VARIANCE EXPLAINED	1.4
NAMING BASED ON	SUMMARIZING

This final factor was also small with 11 meaningful variable loadings. The highest loadings for this factor were variables 36 "I communicate clearly" (.756) and 18 "I give clear, simple directions for shifting from one activity to another" (.709). In this case the naming was relatively easy with the factor's clear emphasis on the clarity of communication. Other variables supporting this interpretation were variable 9 "I show clarity of communication in my presentations" (.706) and variable 37 "I use a level of language students can understand" (.637). The rest of the behavior descriptions in this factor all shared a common feature, verbal communication.

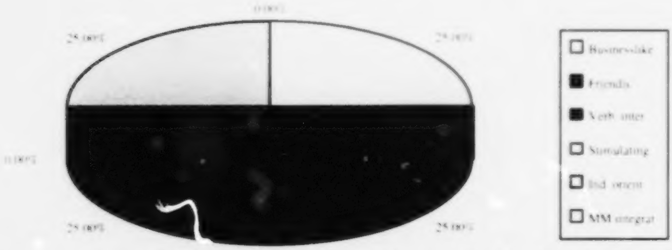


Figure 6.7. Distribution of the variables with high loadings in the complete data factor 5 "Positively Organized" to the Harris model components.

Inspection against the Harris model factors reveals this factor to be again a mixture of three of the original components: "Verbally Interactive", "Friendly" and "Businesslike". Clarity of communication can be easily understood as a descriptive feature of businesslike or verbally interactive teaching, but it is more surprising to find the presence of the friendly component also. One possible explanation is that teaching using the "language of students"; i.e., their special vocabularies, can also be interpreted as friendly although its primary purpose is more to "get the message through" – clarity of interaction.

6.4. THE FACTOR STRUCTURE FOR THE US DATA

The forced 6 factor solution for the US data explained 42.3% of the total variance. In this solution the eigenvalue was 1.9, which indicates under-factoring. The factor size variance was less than in the complete set factor structure. In the following we give a brief description of this 6 factor solution for the US data in a manner similar to the previous section.

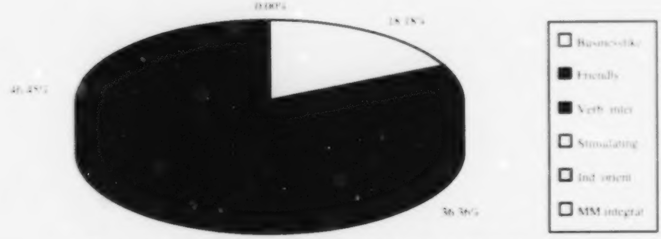


Figure 6.8. Distribution of the variables with high loadings in the complete data factor 6 "Clarity of Communication" into the Harris model components.

FACTOR 1 "INDIVIDUALIZED INSTRUCTION"	
NUMBER OF HIGH LOADING VARIABLES	17
HIGHEST LOADING VARIABLE	VAR 58, LOADING .682
PERCENTAGE OF VARIANCE EXPLAINED	28.3
NAMING BASED ON	SUMMARIZING

This factor had a total of 17 meaningful loadings. The highest loadings for this factor were variables 58 "I use diagnostic information about individuals' current needs in lesson planning" (.682) and 74 "I direct instruction in response to the unique needs and learning styles of individual students" (.661). Both these behaviors emphasize the individual needs of the students, hence the name "Individualized Instruction". The factor had some loadings on variables which emphasized a positive, friendly attitude toward students, for example variable 34 "I free students from embarrassment by using reassuring and supportive statements" (.588) and variable 97 "I praise student efforts, using phrases, sentences, and tonal inflections which are meaningful to the student(s) involved" (.564). In the latter variable the emphasis was clearly on the friendliness demonstrated based on the individual needs of the students.

Inspection of the variable distribution with respect to the Harris model components indicates that this factor indeed seems to be related to the Harris component "Individually Oriented" This connection is not clear for two reasons: the factor has an equal share of variables from the component "Friendly" (23.53%); secondly, to some degree all the other Harris' components are also present in this factor. However, this factor was interpreted as largely representing the Harris' component "Individually Oriented" and named according to the highest loading variables "Individualized Instruction".

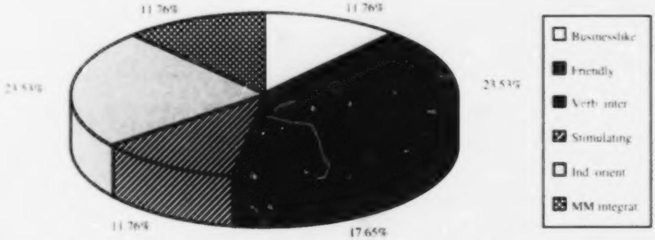


Figure 6.9. Distribution of the variables with high loadings for the US data factor 1 "Individualized Instruction" into the Harris model components.

FACTOR 2 "MULTI-STYLE TEACHING"	
NUMBER OF HIGH LOADING VARIABLES	13
HIGHEST LOADING VARIABLE	VAR 90, LOADING .658
PERCENTAGE OF VARIANCE EXPLAINED	4.0
NAMING BASED ON	SUMMARIZING

This factor was easy to interpret and name with its 13 high loading variables. The highest loading for this factor was variable 90 "I arrange for laboratory experiments, special projects, or action research studies as a part of regular assignments" (.658). All the variables with high loadings were descriptions of various kinds of activities the teacher provides the students with. The factor was named "Multi-Style Teaching". Multi-style teaching included behaviors like variables 89 "I provide for out-of-classroom learning in school and community setting" (.570) and variable 91 "I direct students in using role-plays or socio-dramas in connection with their assignments" (565). The variable distribution with respect to the Harris model components indicates that this factor seems to be related to the Harris component "Multi-Media Integrative". As the figure shows, almost 50% of the variables with high loadings in this factor are from this Harris component. Likewise in the complete data solution (factor 1) the variables from Harris component "Stimulating" mix with the variables from the component "Multi-Media Integrative". This is only natural, because both components in the Harris model have behaviors describing different teaching behaviors to stimulate the students with multiple teaching activities and multi-media.

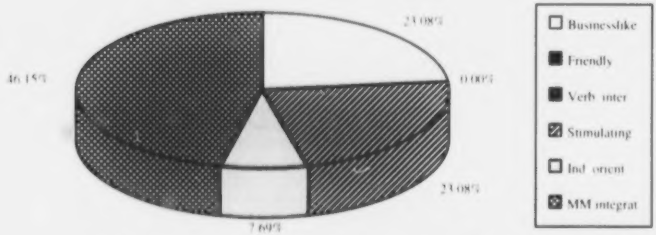


Figure 6.10. Distribution of the variables with high loadings for US data factor 2 "Multi-Style Teaching" into the Harris model components.

FACTOR 3 "STIMULATING"	
NUMBER OF HIGH LOADING VARIABLES	15
HIGHEST LOADING VARIABLE	VAR 49, LOADING .799
PERCENTAGE OF VARIANCE EXPLAINED	3.4
NAMING BASED ON	HIGHEST LOADING

This factor in the US data was very similar to factor 1 in the complete data. It had a total of 15 meaningful variable loadings. The highest loading for this factor was the same as in the complete data solution, variable 49 "I am a stimulating teacher" (.799). The variables 82 "I am an exciting teacher" (728), variable 65 "I am an interesting teacher" (726) and variable 47 "I am an imaginative teacher" (.732) all correlated together and described the same underlying concept of stimulating teaching behavior. The factor was named "Stimulating" according to the highest loading variable. The other behaviors with high loadings for this factor like variable 35 "I set up and provide resources for a wide variety of challenging learning activities, e.g., inquiries, experiments, simulations, case studies, interviews, brainstorming" (.512) and variable 48 "I use a variety of audio-visual and manipulative aids regularly as integral parts of lessons and assignments" (.634) can be interpreted as the techniques the teacher uses to make his teaching stimulating.

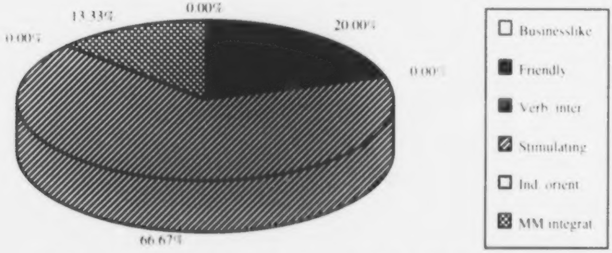


Figure 6.11 Distribution of the variables with high loadings in US data factor 3 "Stimulating" into the Harris model components.

Inspection of the variable distribution with respect to the Harris model components indicates that this factor indeed seems to be related to the Harris component "Stimulating". As the figure shows, almost 70% of the variables with high loadings come from this Harris component. In fact this factor is relatively "pure", having no variables from Harris components "Businesslike" "Verbally Interactive" or "Individually Oriented", and is the best matching factor in our factor structure with respect to the Harris components.

FACTOR 4 "CARING"	
NUMBER OF HIGH LOADING VARIABLES	20
HIGHEST LOADING VARIABLE	VAR 24, LOADING .716
PERCENTAGE OF VARIANCE EXPLAINED	2.5
NAMING BASED ON	SUMMARIZING

The factor had a total of 20 loadings. The highest loading for this factor was variable 24 "I am a warm teacher" (.716). The next highest loaded variables 52 "I demonstrate interest and concern for students nonverbally in a variety of ways" (.670) and variable 25 "I express interest in individuals as persons over and above being students" (.659) described the same kind of warm, caring behavior. The factor was named "Caring". The other high loadings supported this interpretation, for example variable 99 "I reflect empathy, concern, and warm liking of students as related to both school and other aspects of life" (.635) and variable 21 "I encourage students to share thoughts and feelings" (.631).

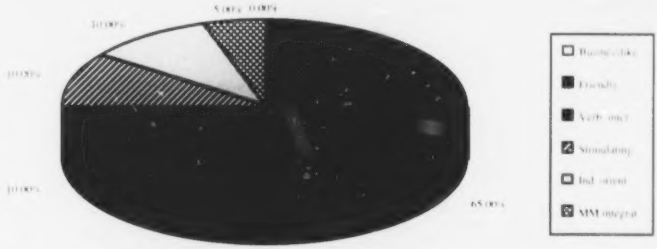


Figure 6.12. Distribution of the variables with high loadings in US data factor 4 "Caring" into the Harris model components.

Inspection of the variable distribution with respect to the Harris model components indicates that this factor is indeed related to the Harris component "Friendly". However, this factor reflects only one facet of the general notion of a "friendly teacher" originally present in the Harris structure, namely the emphasis on using caring, warm gestures to students in teaching interaction. Interestingly, another facet of this "Friendly" component was reflected in the complete data, the use of teachers' personality in classroom teaching. These findings provide more evidence that the component "Friendly" consists of many different subcomponents.

FACTOR 5 "ORGANIZED COMMUNICATION"	
NUMBER OF HIGH LOADING VARIABLES	14
HIGHEST LOADING VARIABLE	VAR 18, LOADING .680
PERCENTAGE OF VARIANCE EXPLAINED	2.0
NAMING BASED ON	SUMMARIZING

In this factor the behaviors emphasizing organization and clear verbal communication skills had the highest loadings. The highest loading variable was variable 18 "I give clear, simple directions for shifting from one activity to another" (.680). Variables 9 "I show clarity of communication in my presentations" (.646) and variable 15 "I organize classroom activities to produce a smooth flow of events with a minimum of confusion or waste of time" (.612) were the next highest ranking behaviors. This factor was reasonably easy to interpret and name with its 14 variables all describing organized communication.

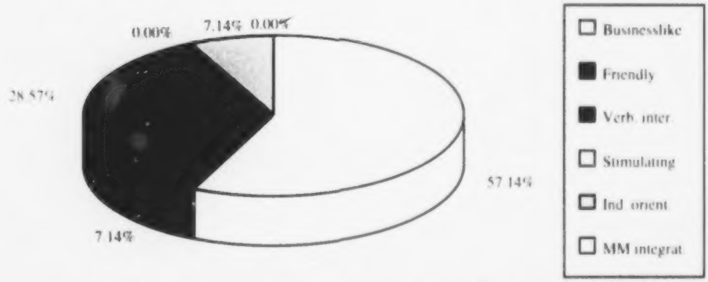


Figure 6.13. Distribution of the variables with high loadings in US data factor 5 "Organized Communication" into the Harris model components.

Inspection against the Harris model factors reveals this factor to be again a mixture of two of the original components: "Verbally Interactive" and "Businesslike". From the component "Verbally Interactive" the variables describing clarity of communication are here but the main emphasis is on organized communication to make the shift from one activity to another as smooth as possible. The factor clearly reflects one facet of businesslike behavior, the organized teacher. To be organized and communicate it to the children requires strong skills in clear communication too, which is one facet of the verbally interactive teacher.

FACTOR 6 "STUDENTS' THINKING PROVOKING"	
NUMBER OF HIGH LOADING VARIABLES	16
HIGHEST LOADING VARIABLE	VAR 44, LOADING .700
PERCENTAGE OF VARIANCE EXPLAINED	2.0
NAMING BASED ON	SUMMARIZING

The factor had a total of 16 loadings. The highest loading for this factor was variable 44 "I ask suggestions from my students" (.700). The other high loading variables had the same emphasis on provoking students' ideas and their thinking; for example, variable 55 "I listen to students' ideas, incorporating them into the lesson and recognizing their worth" (.674) and variable

45 "I encourage alternative answers, rephrasing to suggest responses from different students" (.659). Some of the behaviors described other kinds of provocative behaviors to stimulate the students for example variable 53 "I improvise furniture, objects, costumes, or sets to meet unique or spontaneous needs" (.645). These behaviors can also be interpreted as provoking students' thinking.

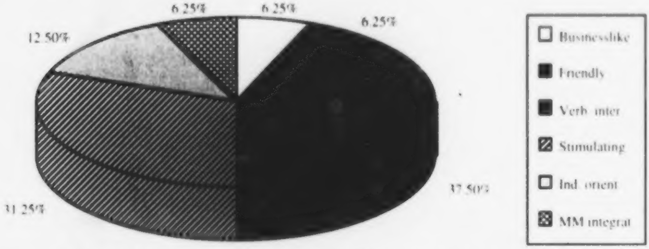


Figure 6.14. Distribution of the variables with high loadings in US data factor 6 "Students' Thinking Provoking" into the Harris model components.

Inspection against the Harris model factors reveals this factor to be a mixture of two of the original components: "Verbally Interactive" and "Stimulating". From the component "Verbally Interactive" the variables describing the questioning skills are here with their emphasis on provoking students' thinking. From the component "Stimulating" different ways than verbal ones are described in the variables emphasizing provoking students' thinking. The variables reflecting these two components explain almost 70% of the high loadings in this factor. As the figure shows, the factor had a very small percentage of variables from the other components of the Harris model and clearly reflected these two, "Verbally Interactive" and "Stimulating".

6.5. THE FACTOR STRUCTURE FOR THE FINNISH DATA

The forced 6 factor solution for the Finnish data explained 40.7% of the variance. The eigenvalue 1.8 indicates under-factoring which is reflected in the difficulty of the factor interpretation. In the following we give a brief description of this 6 factor solution for the Finnish data in a manner similar to the previous section.

FACTOR 1 "MULTIPLE LEARNING ACTIVITIES PROVIDING"	
NUMBER OF HIGH LOADING VARIABLES	30
HIGHEST LOADING VARIABLE	VAR 89, LOADING .707
PERCENTAGE OF VARIANCE EXPLAINED	24.3
NAMING BASED ON	SUMMARIZING

Factor 1 is a large factor showing 30 variables with high loadings. The interpretation was difficult because the factor included so many different teaching behaviors. The most common underlying feature behind these behaviors was the use of different teaching activities. The highest loading for this factor was variable 89 "I provide for out-of-classroom learning in school and community setting" (.707). The next highest loadings were on variables 90 "I arrange for laboratory experiments, special projects, or action research studies as a part of regular assignments" (.684) and variable 88 "I utilize games in ways which stimulate interest and participation without excessive competition" (.665).

The factor had several behaviors emphasizing the individual needs of students; for example, variable 98 "I organize materials and resources for student use so that individual learners have what they need when they need it" (.594) and variable 93 "I depart from standard curricular expectations to respond to urgent individual needs" (.575). One way to meet these individual needs is to provide different activities according to the learning needs of a student. The factor was named "Multiple Learning Activities Providing". With respect to the Harris model components this factor is a mixture of the five components "Multi-Media Integrative", "Stimulating", "Businesslike", "Verbally Interactive", and "Individually Oriented". The only component not present in the factor is "Friendly". The variables from the components "Multi-Media Integrative" and "Stimulating" reflect 60% of the factor with emphasis on various learning activities. This factor is not clear with respect to the Harris model components, and with its 30 variable loadings it is the most difficult factor to interpret. This indicates a severe mismatch, and need for a better factor solution with more factors.

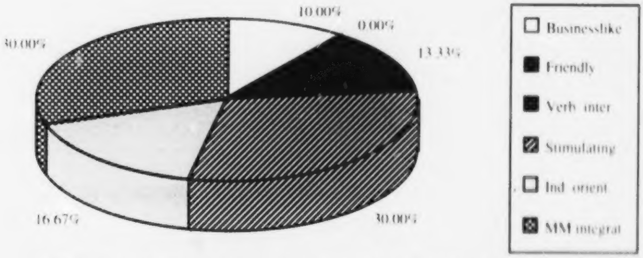
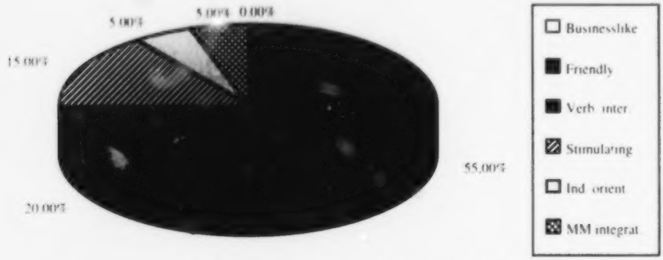


Figure 6.15. Distribution of the variables with high loadings in Finnish data factor 1 "Multiple Learning Activities Providing" into the Harris model components.

FACTOR 2 "VERBAL FRIENDLINESS"	
NUMBER OF HIGH LOADING VARIABLES	20
HIGHEST LOADING VARIABLE	VAR 66, LOADING .681
PERCENTAGE OF VARIANCE EXPLAINED	6.6
NAMING BASED ON	SUMMARIZING

This factor had 20 variables with high loadings. The highest loading for this factor was variable 66 "I maintain eye contact with students when interacting verbally with them" (.681). The factor was named "Verbal Friendliness" with the emphasis on friendly verbal communication and encouragement of verbal interaction. The other high loadings for this factor were variable 39 "I encourage and guide student responses and teacher-student interactions" (.634) and variable 57 "I elaborate on subject matter by drawing from a personal knowledge base which is accurate, up-to-date, and of significant depth" (.646).

Inspection of the variable distribution with respect to the Harris model components indicates that this factor is indeed related to the Harris component "Friendly". However, this factor reflects again only one facet of the general notion of a "friendly teacher" originally present in the Harris structure, namely the emphasis on using verbal friendliness in encouraging the students. It is natural that the variables from the component "Verbally Interactive" have high loadings in this factor supporting the verbal facet of this factor. As can be observed, these two components together explain 75% of the high loadings in this factor.



. Figure 6.16. Distribution of the variables with high loadings in Finnish data factor 2 "Verbal Friendliness" into the Harris model components.

FACTOR 3 "CLARITY OF COMMUNICATION"	
NUMBER OF HIGH LOADING VARIABLES	6
HIGHEST LOADING VARIABLE	VAR 36, LOADING .711
PERCENTAGE OF VARIANCE EXPLAINED	2.9
NAMING BASED ON	HIGHEST LOADING

This factor was a small one with only six meaningful loadings. The interpretation was evident, although all the variables in the factor emphasized clear communication skills. The highest loading was on variable 36 "I communicate clearly" (.711) and the factor was named accordingly. The other high loadings were for example on variables 18 "I give clear, simple directions for shifting from one activity to another" (.608) and variable 9 "I show clarity of communication in my presentations" (.599).

With respect to the Harris model components this factor is clearly a subcomponent of the abstract notion of "Verbally Interactive" teaching. Clarity of communication was reflected in this factor together with an emphasis on friendliness. There were no variables present from the components "Individually Oriented", "Stimulating", or "Multi-Media Integrative".

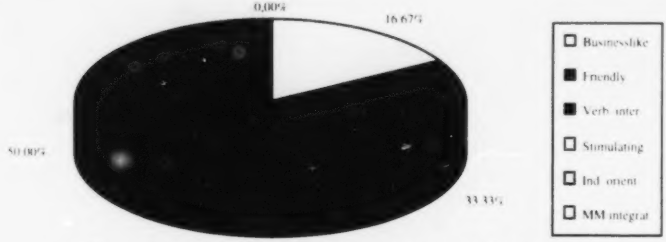


Figure 6.17. Distribution of the variables with high loadings in Finnish data factor 3 "Clarity of Communication" into the Harris model components.

FACTOR 4 "TIME-ON-TASK"	
NUMBER OF HIGH LOADING VARIABLES	19
HIGHEST LOADING VARIABLE	VAR 6, LOADING .702
PERCENTAGE OF VARIANCE EXPLAINED	2.5
NAMING BASED ON	SUMMARIZING

This factor was difficult to interpret with 19 high variable loadings in it. Several high loading variables emphasized meeting the needs of an individual student. The factor had a strong emphasis on individual work as well as task completion. The highest loading for this factor was variable 6 "I encourage and direct students in assisting each other to assure task completion" (.702). Variables 80 "I lead students in checking and correcting their own work diagnostically" (.678) and 10 "I initiate changes in activity for individuals who are ready while others are still busy with prior assignments" (.657) had the next highest loadings. In addition three variables emphasizing outgoing friendliness had high loadings in this factor, for example variable 29 "I tell and listen to jokes, puns, or amusing incidents" (.434). These variables did not seem to measure the same underlying concept and we named the factor according to the highest loadings as "Time-On-Task". Inspection of the variable distribution with respect to the Harris model components indicates that this factor seems to be related to the Harris component "Businesslike" featuring the facet of "Time-On-Task" behavior. This connection is not clear though, as the factor also has a reasonably high portion of variables from the component "Friendly" (21.05%). The majority of the variables (52.63%) reflect time spent on academic activities and the factor was named "Time-On-Task".

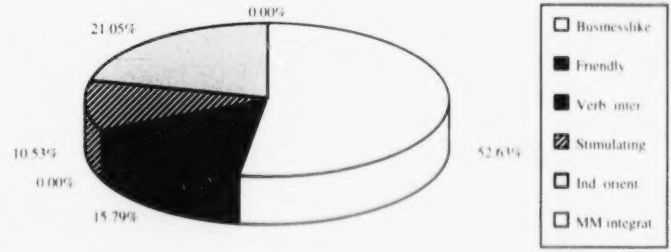


Figure 6.18. Distribution of the variables with high loadings in Finnish data factor 4 "Time-On-Task" into the Harris model components.

FACTOR 5 "STUDENTS' THINKING PROVOKING"	
NUMBER OF HIGH LOADING VARIABLES	7
HIGHEST LOADING VARIABLE	VAR 44, LOADING .567
PERCENTAGE OF VARIANCE EXPLAINED	2.4
NAMING BASED ON	SUMMARIZING

This factor had 7 meaningful variable loadings. The highest loading for this factor was variable 44 "I ask for suggestions from my students" (.567). The factor was named "Students' Thinking Provoking" as the other high loading variables support this interpretation; for example, variable 46 "I utilize a variety of questioning techniques which provoke different levels of thinking on the part of all students" (.553). Comparison with the Harris model factors reveals this factor to be a mixture of three of the original components: "Multi-Media Integrative", "Verbally Interactive" and "Stimulating". In this factor from the Harris component "Verbally Interactive" the variables describing the questioning skills are present, with their emphasis on provoking students' thinking. From the component "Stimulating" other means than verbal ones are described in the variables emphasizing provoking students' thinking. The component "Multi-Media Integrative" contributes with variables describing the use of different multi-media in attempting to provoke students' thinking.

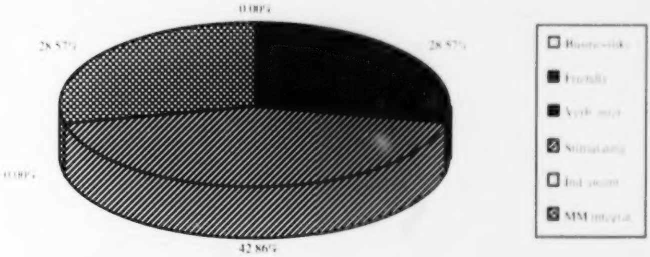


Figure 6.19. Distribution of the variables with high loadings in Finnish data factor 5 "Students' Thinking Provoking" into the Harris model components.

FACTOR 6 "STIMULATING AND ENCOURAGING"	
NUMBER OF HIGH LOADING VARIABLES	12
HIGHEST LOADING VARIABLE	VAR 47, LOADING .660
PERCENTAGE OF VARIANCE EXPLAINED	2.0
NAMING BASED ON	SUMMARIZING

The factor had a total of 12 meaningful variable loadings. This factor is a mixture of variables describing a stimulating teacher and an encouraging, warm teacher. The factor was named "Stimulating and Encouraging". The highest loading variable was 47 "I am an imaginative teacher" (.660). The variables 65 "interesting" (.611), 49 "stimulating" (.603) and 82 "exciting" (.504) all correlated with this highest loading variable and indicated the same underlying concept. Variables 24 "I am a warm teacher" (.583) and 8 "I am an encouraging teacher" (.567) emphasized the encouraging character of this factor. Inspection against the Harris model factors confirms the analysis above as this factor is a mixture of two of the original components: "Friendly" and "Stimulating", over 90% of the variables in this factor reflecting these two components. From the component "Friendly" the substructure of an encouraging teacher was highlighted, giving again more evidence of the component "Friendly" having a multidimensional structure.

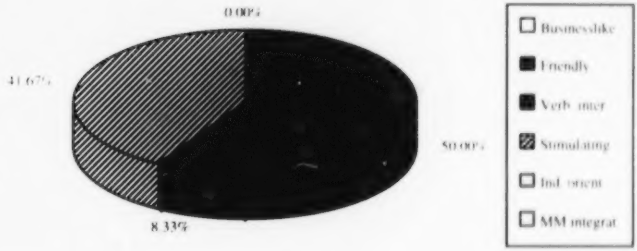


Figure 6.20. Distribution of the variables with high loadings in Finnish data factor 6 "Stimulating and Encouraging" into the Harris model components.

6.6. OBTAINED STRUCTURE VS. THE HARRIS STRUCTURE

In the previous sections we have investigated a forced factor structure of the various data sets in an attempt to find indications of the Harris model. Together with the factor interpretations we also made elementary comparisons of the individual factors against the Harris components by inspecting the Harris model origin of the high loading variables. Although very illustrative and simple to follow, such a basic counting of variable proportions has a flaw, since it gives a somewhat distorted view of the situation due to the simple fact that in the original variable set Harris model components had a differing number of representative variables (e.g., Friendly area 22 and Individually Oriented 10). Thus we actually are more interested in reversing the comparison process and checking how the Harris model component variables are distributed among the factors in the forced 6 factor solution. In the ideal case of a perfect match with the Harris model one would expect to find a one-to-one match between the factors discovered and the components, and in the worst case a uniform distribution of the component variables into each of the factors. From the previous discussions it is already evident that neither of these extremes is the case at hand.

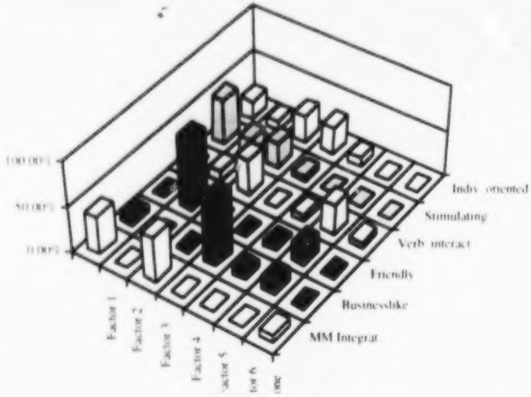


Figure 6.21. Distribution of the Harris model component variables into the forced 6 factor solution for the complete data.

Figures from 6.21 to 6.23 depict the Harris model component variable distributions for the complete set, and the US and Finnish data sets. From visual inspection of these histograms several interesting observations can be made.

For the complete data one can clearly identify correspondence of two Harris components only: Businesslike (factor 4) and Friendly (factor 2). For the rest of the components the distribution has at least two significant peaks, although in the case of Stimulating one of the peaks is clearly more dominant. Even the Multi-Media Integrative component, which can be identified clearly both in the US and Finnish data sets has a two-peak distribution with peaks of almost equal in size.

The match for the US data is unquestionably the best. One can identify good matches for five of the Harris components: Individually Oriented (factor 1), Multi-Media Integrative (factor 2), Stimulating (factor 3), Friendly (factor 4) and Businesslike (factor 5). The only mismatched component is thus Verbally Interactive, a component which tends to be easily confused with components such as Stimulating and Businesslike as all of them involve teaching behavior with many verbal components. One should also observe that the match is nicely partitioned, none of the matched factors having high peaks for two Harris components.

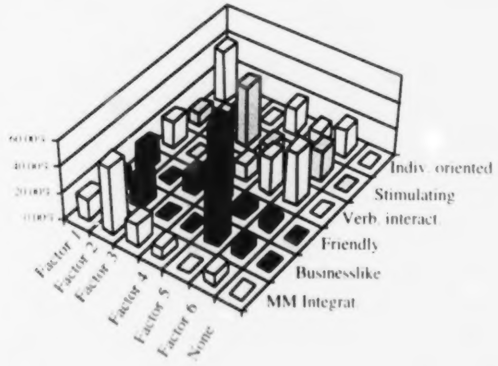


Figure 6.22. Distribution of the Harris model component variables into the forced 6 factor solution for the US data.

For the Finnish data the match is even less evident than for the complete data (which of course should be obvious as the clear match in the US data affects the match in the full set also). One can only identify two Harris components with a clear match: Multi-Media Integrative (factor 1) and Businesslike (factor 4). In addition the variable distribution for the rest of the components is closer to uniform than the corresponding distributions for the complete data.

Can the superior match of the US data and the very inferior match of the Finnish data be taken as evidence to support the hypothesis of the cultural dependence of the Harris model? Unfortunately such conclusions cannot be straightforwardly inferred. For reasons discussed already in Chapter 5 the Finnish data set is much more heterogeneous than the US data set as the questionnaire context for about half of the sample was subject-specific. This might have confused the factor structure much more than the pure geographical differences present in the US data. Such a concern is even more justifiable in the light of the results of the discriminant analysis of Chapter 7. However, one should not let this fact lessen the importance of the observation that the differences in the matching structure between the US and the Finish data were so significant, and that this data definitely does not refute the hypothesis of cultural dependence.

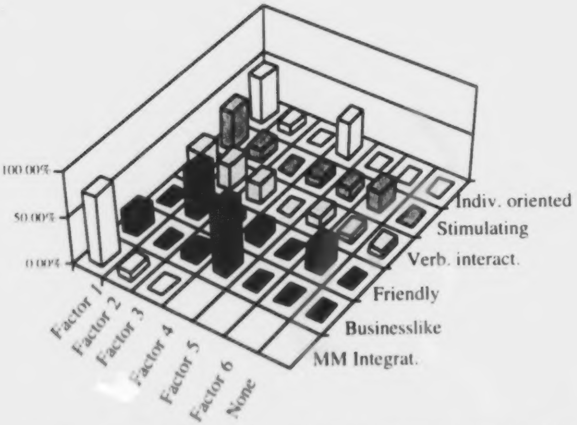


Figure 6.23. Distribution of the Harris model component variables into the forced 6 factor solution for Finnish data.

Chapter 7

DIMENSIONS OF TEACHER CLASSROOM BEHAVIOR

7.1. THE GENERAL APPROACH

In the previous Chapter we analyzed the data at hand by constraining the factor structure space to solutions with six factors to be able to compare the results to the Harris six component model structure. Interesting structural differences across the data sets have been identified above. However, it is very likely that the Harris six component structure represents a very abstract model, and that the components themselves have an underlying substructure. Two indicators support this hypothesis. First, the method Harris used to construct the components is based on aggregates, for example by combining several dimensions empirically discovered by Ryans (Harris 1986, pp. 71). Secondly a previous factor analytical study (Tirri 91) revealed a possible substructure for the components.

Consequently, one can reasonably assume that an unconstrained factor analysis would produce a vastly higher number of factors than six. In Sections 7.2.-7.4 we will explore the unconstrained factor structures underlying the data first by performing a factor analysis for the data as a whole, and then on the US and Finnish data separately. We will show that much larger structures with 16 to 18 factors can indeed be extracted. We will call these factors primary factors as in many cases they are specific subcomponents of Harris's components.

Identification of such primary structures also allows us to attempt to discover more abstract structures at the same abstraction level as the original Harris components without constraining the number of factors in the analysis, as such constraints can have a distorting effect on the analysis. This can be achieved by performing a second order factorization for the US and Finnish data using the factor scores of the previous analysis phases, the topic for Section 7.5. We will see that the abstract structures discovered not only differ from each other, but also do not exhibit clear relationships with the original Harris components (even the number of factors in the second order factorizations differ from the six assumed in the Harris model).

Since our interest is focused on cross-cultural differences in Section 7.6 we return to the results of the initial factor analysis, and compare the primary factor structure of the US data to the corresponding structure of the Finnish data. Since all the calculated matrices are available, we are able to perform the comparison based on the rotation method suggested by Kaiser, Hunka and Bianchini (Kaiser et al 1971) by using a slightly modified FACTREL software module. This gives us a more rigorous foundation for relating the primary factors in the two data sets than a purely visual inspection, or the use of simple statistical indicators such as the coefficient of congruence. In the light of the previous negative results we will somewhat unexpectedly show that the primary structures exhibit a good structural match, in which 66% of the primary factors can be related to a unique mate.

This result then prompts the question of whether or not one is able to find good discriminators between the different data sets. Thus in the last Section of this Chapter we will report the results of a discriminant analysis performed on the data sets. In this analysis we have gone further than just testing the discriminator between American and Finnish teachers; we have also attempted to identify discriminators for the geographical areas from which the data is gathered. As we will show, such discriminators can be found.

7.2. FACTOR ANALYSIS RESULTS FOR THE COMPLETE DATA

The chosen 16 factor solution explained 59.1% of the total variance. Both the Kaiser-Meyer-Olkin measure (.956) and the Bartlett test of sphericity (21751, significance .000) indicate that enough covariance was present to justify factor analysis. The interitem consistency (Anastasi 1988, pp. 123-125) for the factors was high, as the Cronbach alpha values listed (Figure 7.1.) illustrate. As suggested earlier, to increase the readability we have reported the high loading variables in Appendix 7 instead of incorporating them into the text.

FACTOR 1: STIMULATING	.925
FACTOR 2: INTERACTION GUIDING	.860
FACTOR 3: MOTIVATING STUDENTS	.870
FACTOR 4: TIME-ON-TASK	.765
FACTOR 5: PROGRESS ASSURING VERBALITY	.843
FACTOR 6: ORGANIZED COMMUNICATION	.842
FACTOR 7: PROJECT-BASED INTEGRATIVE	.873
FACTOR 8: STUDENTS' PERSONAL AFFAIRS ORIENTED	.696
FACTOR 9: ENCOURAGING	.839
FACTOR 10: STUDENT-TEACHER EQUALITY	.678
FACTOR 11: MATERIALS INTEGRATIVE	.875
FACTOR 12: GOAL-ORIENTED	.791
FACTOR 13: POSITIVELY ORGANIZED	.771
FACTOR 14: UNLABELED	-[6]
FACTOR 15: FLEXIBILITY	.819
FACTOR 16: EXTERNAL SOURCES INTEGRATIVE	.797

Figure 7.1. The Cronbach alpha values for the factors in the complete data.

FACTOR 1 "STIMULATING"	
NUMBER OF HIGH LOADING VARIABLES	9
HIGHEST LOADING VARIABLE	VAR 65, LOADING .817
PERCENTAGE OF VARIANCE EXPLAINED	37.0
NAMING BASED ON	SUMMARIZING

This factor has 9 meaningful variable loadings. The highest loading for this factor is variable 65 "I am an interesting teacher" (.817). The factor was named "Stimulating" as the other high loading variables support this interpretation; for example, variable 82 "I am an exciting teacher" (.795) and variable 49 "I am a stimulating teacher" (.764). This factor contains adjectives describing a stimulating teacher and behaviors that emphasize different ways of communicating excitement and stimulation to the students, for example in variable 56 "I communicate excitement, surprise, and wonder about the lesson or event by inflection and by varying speaking rate, gestures, and body movement" (.660). In this case the factor interpretation was easy as all of the behaviors in this factor clearly reflect stimulating teaching behavior. An interesting observation is that these behaviors all come from the original Harris model component "Stimulating".

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[6] For a single variable factor the Cronbach alpha value can not be calculated.

FACTOR 2 "INTERACTION GUIDING"	
NUMBER OF HIGH LOADING VARIABLES	6
HIGHEST LOADING VARIABLE	VAR 39, LOADING .698
PERCENTAGE OF VARIANCE EXPLAINED	4.4
NAMING BASED ON	SUMMARIZING

These six variables with high loadings in this factor share a common feature, teacher-student interaction. The highest loading variable 39 "I encourage and guide student responses and teacher-student interactions" (.698) states this clearly, as do some of the other variables which describe teacher behaviors in support of this ultimate goal. Variables 41 "I am a personal teacher" (.664) and 38 "I smile openly, broadly, and frequently; and laugh freely when appropriate" (.636) are teaching behaviors supporting and guiding the verbal interaction in the classroom.

FACTOR 3 "MOTIVATING STUDENTS"	
NUMBER OF HIGH LOADING VARIABLES	7
HIGHEST LOADING VARIABLE	VAR 44, LOADING .652
PERCENTAGE OF VARIANCE EXPLAINED	2.8
NAMING BASED ON	SUMMARIZING

This factor has high loadings in variables which emphasize questioning skills (for example variables 44,45 and 46). Students' own interests and ideas are recognized in applications in the classroom (variables 54 and 55). The main emphasis in this factor is clearly on motivating the students. The teacher needs questioning skills, use of students' ideas, etc., to motivate the students to learn.

FACTOR 4 "TIME-ON-TASK"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 14, LOADING .614
PERCENTAGE OF VARIANCE EXPLAINED	2.1
NAMING BASED ON	SUMMARIZING

In this factor the clear emphasis is on scheduling the academic learning time. Two of the variables (6 and 10) deal directly on the time-on-task behavior, while the two other variables in this factor describe different ways to arrange the students for work. We interpreted these arrangements for students to work individually (variable 14) or for students to work in small groups (variable 42) to support the time-on-task behavior. Depending on the task in hand the teacher arranges the students to work in the way which produces most time spent in academic learning.

FACTOR 5 "PROGRESS ASSURING VERBALITY"	
NUMBER OF HIGH LOADING VARIABLES	5
HIGHEST LOADING VARIABLE	VAR 102, LOADING .617
PERCENTAGE OF VARIANCE EXPLAINED	1.9
NAMING BASED ON	SUMMARIZING

This factor reflects positive verbal communication from the teacher to the students. Underlying this communication is a clear emphasis on assuring that the students are progressing (variable 83) and finding their own ways to learn (variable 100). To highlight this aspect of verbal communication the factor was named "Progress Assuring Verbality".

FACTOR 6 "ORGANIZED COMMUNICATION"	
NUMBER OF HIGH LOADING VARIABLES	5
HIGHEST LOADING VARIABLE	VAR 18, LOADING .747
PERCENTAGE OF VARIANCE EXPLAINED	1.5
NAMING BASED ON	SUMMARIZING

This factor emphasizes clarity of communication. Variable 15 highlights the aspect of organization skills in managing the classroom. We named the factor "Organized Communication" to integrate both these trends in this factor.

FACTOR 7 "PROJECT-BASED INTEGRATIVE"	
NUMBER OF HIGH LOADING VARIABLES	7
HIGHEST LOADING VARIABLE	VAR 90, LOADING .762
PERCENTAGE OF VARIANCE EXPLAINED	1.4
NAMING BASED ON	HIGHEST LOADING

This factor is easy to interpret with its clear emphasis on the different learning projects the teacher provides the students with. These projects include role-plays, socio-dramas, laboratory experiments, discussion groups, case studies, brainstorming, etc. The goal of using all these learning activities is to provide the students opportunities to explore, share knowledge with each other and stimulate interest without competition.

Factor 8 "Students' Personal Affairs Oriented"	
Number of high loading variables	3
Highest loading variable	VAR 29, LOADING .684
Percentage of variance explained	1.2
Naming based on	Summarizing

This small factor emphasizes an outgoing teacher who listens to his students and their personal affairs with a good sense of humor. Telling jokes and anecdotes was interpreted as a way to create an open and supportive climate in the classroom, where the students can also share more personal things about themselves.

Factor 9 "Encouraging"	
Number of high loading variables	5
Highest loading variable	VAR 8, LOADING -.720
Percentage of variance explained	1.1
Naming based on	Summarizing

This factor is very apparent with its strong emphasis on encouraging teaching behavior. The encouragement is reflected in the way the teacher speaks to the students and gives them the opportunity to share their thoughts and feelings. An encouraging teacher is also warm and treats the students in a personal way.

Factor 10 "Student-Teacher Equality"	
Number of high loading variables	3
Highest loading variable	VAR 86, LOADING .612
Percentage of variance explained	1.0
Naming based on	Summarizing

This factor reflects a teacher who treats his students democratically and as his equals. The teacher respects the students' comments and efforts and participates himself in the activities both as leader and as an equal participant with the students.

Factor 11 "Materials Integrative"	
Number of high loading variables	6
Highest loading variable	VAR 92, LOADING .631
Percentage of variance explained	1.0
Naming based on	Summarizing

The main emphasis in this factor is on the materials the teacher uses in his classroom teaching. These materials include books, artifacts, student-made materials, newspapers, tests, etc. Even the personal experiences of the teacher can be interpreted as "materials" in this context. These experiences can be shared for example by distributing items such as photos or letters, which are not directly mentioned here.

FACTOR 12 "GOAL-ORIENTED"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 12, LOADING .758
PERCENTAGE OF VARIANCE EXPLAINED	0.9
NAMING BASED ON	SUMMARIZING

This factor reflects a goal-oriented teacher, who specifies the objectives for his lesson and displays them to the students in advance. Everybody in the classroom knows their responsibilities and the goals they are aiming at.

FACTOR 13 "POSITIVELY ORGANIZED"	
NUMBER OF HIGH LOADING VARIABLES	5
HIGHEST LOADING VARIABLE	VAR 22, LOADING .638
PERCENTAGE OF VARIANCE EXPLAINED	0.7
NAMING BASED ON	SUMMARIZING

Two trends can be seen in this factor. The one is a warm, positive and personal attitude and the other emphasizes a well-prepared teacher with all the teaching materials ready for use. In our labeling we integrated these two aspects and named the factor "Positively Organized".

FACTOR 14 "UNLABELED"	
NUMBER OF HIGH LOADING VARIABLES	1
HIGHEST LOADING VARIABLE	VAR 5, LOADING .447
PERCENTAGE OF VARIANCE EXPLAINED	0.7
NAMING BASED ON	NONE

The single variable forming this factor has low communality value (.228), and is problematic in each of the data interpretations. It seems that as a consequence of the ambiguity of the statement (see discussion in Section 5.5) it correlates poorly with any of the other dimensions and is not even associated with the variables from the original Harris component "Verbally Interactive".

FACTOR 15 "FLEXIBILITY"	
NUMBER OF HIGH LOADING VARIABLES	6
HIGHEST LOADING VARIABLE	VAR 19, LOADING .617
PERCENTAGE OF VARIANCE EXPLAINED	0.7
NAMING BASED ON	SUMMARIZING

In this factor the emphasis is on flexible teaching behavior. The teacher acknowledges the unique needs and learning styles of individual students and responds spontaneously to the events in the classroom. The time frames are kept flexible like the whole learning environment and unplanned events are welcome. For this kind of flexible teacher physical contacts, such as patting on the back, are natural between the teacher and the students.

FACTOR 16 "EXTERNAL SOURCES INTEGRATIVE"	
NUMBER OF HIGH LOADING VARIABLES	3
HIGHEST LOADING VARIABLE	VAR 48, LOADING .686
PERCENTAGE OF VARIANCE EXPLAINED	0.7
NAMING BASED ON	SUMMARIZING

In this factor the use of external sources and different teaching materials is highlighted. These sources include audio-visual materials, manipulative aids and self-invented materials.

7.3. FACTOR ANALYSIS RESULTS FOR THE US DATA

The 18 factor solution chosen explained 59.1% of the total variance. Both the Kaiser-Meyer-Olkin measure (.840) and the Bartlett test of sphericity (10466, significance .000) indicate that enough covariance was present to justify factor analysis. The interitem consistency for the factors was high, as the Cronbach alpha values in Figure 7.2. illustrate.

FACTOR 1 "INDIVIDUALLY ORIENTED"	
NUMBER OF HIGH LOADING VARIABLES	7
HIGHEST LOADING VARIABLE	VAR 58, LOADING .663
PERCENTAGE OF VARIANCE EXPLAINED	28.5
NAMING BASED ON	SUMMARIZING

The emphasis in this factor is obviously on the individual needs of the students. All the other variables except variable 92 highlight individual orientation in some way. Variable 92 seems to be out of context with its emphasis on using different kinds of materials in the classroom. On the other hand, the reason for using different kinds of materials can be interpreted as the need to offer every student the right kind of materials for their individual learning needs.

FACTOR 2 "PROJECT-BASED INTEGRATIVE"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 89, LOADING -.743
PERCENTAGE OF VARIANCE EXPLAINED	4.2
NAMING BASED ON	SUMMARIZING

This factor reflects the use of different projects: laboratory experiments, role-plays, action research, etc., to provide the students with other alternatives than ordinary classroom learning. This interpretation was obvious and the factor was named "Project-Based Integrative".

FACTOR 1: INDIVIDUALLY ORIENTED	.845
FACTOR 2: PROJECT-BASED INTEGRATIVE	.835
FACTOR 3: EXCITING	.900
FACTOR 4: EMPHATIC	.836
FACTOR 5: TIME-ON-TASK	.706
FACTOR 6: STUDENTS' INTERESTS CONSIDERING	[illegible]
FACTOR 7: GROUP ACTIVITY ORIENTED	.778
FACTOR 8: GOAL-ORIENTED	.759
FACTOR 9: CLARITY OF COMMUNICATION	.818
FACTOR 10: ORGANIZED	.805
FACTOR 11: USE OF STIMULATING METHODS	.738
FACTOR 12: MULTI-STYLE TEACHING	.733
FACTOR 13: STUDENTS' THINKING PROVOKING	.820
FACTOR 14: STUDENTS' NEEDS ADAPTIVE	.425
FACTOR 15: EXTERNAL SOURCES INTEGRATIVE	.674
FACTOR 16: FLEXIBILITY	.725
FACTOR 17: UNLABELED	.507
FACTOR 18: PERSONAL FRIENDLINESS	.798

Figure 7.2. The Cronbach alpha values for the factors in the US data.

FACTOR 3 "EXCITING"	
NUMBER OF HIGH LOADING VARIABLES	5
HIGHEST LOADING VARIABLE	VAR 49, LOADING -.802
PERCENTAGE OF VARIANCE EXPLAINED	3.6
NAMING BASED ON	SUMMARIZING

This factor reflects an exciting, imaginative teacher, who is also interesting and stimulating. Variable 56 supports this interpretation as such qualities can be communicated by body movements and changes in facets of verbal communication, such as tone of voice.

FACTOR 4 "EMPHATIC"	
NUMBER OF HIGH LOADING VARIABLES	8
HIGHEST LOADING VARIABLE	VAR 24, LOADING -.632
PERCENTAGE OF VARIANCE EXPLAINED	2.7
NAMING BASED ON	SUMMARIZING

This factor reflects an emphatic teacher who avoids giving negative reactions or embarrassing the students. The teacher expresses interest in students as persons and demonstrates concern and warm liking of them in many ways.

FACTOR 5 "TIME-ON-TASK"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 14, LOADING .626
PERCENTAGE OF VARIANCE EXPLAINED	2.2
NAMING BASED ON	SUMMARIZING

The three highest loading variables in this factor have an apparently common emphasis on keeping the students involved in learning. To keep the students on task the teacher arranges the individuals who are ready with their prior assignments to do something else, for example to work individually. The only variable that seems to be out of the context is variable 4. The loading for this variable is less than .4 and we put a stronger emphasis on the other higher loadings in this factor in the interpretation. In fact inquiring about students' personal accomplishments or interests can be an effective way to have them spend more time on task!

FACTOR 6 "STUDENTS' INTERESTS CONSIDERING"	
NUMBER OF HIGH LOADING VARIABLES	5
HIGHEST LOADING VARIABLE	VAR 44, LOADING .741
PERCENTAGE OF VARIANCE EXPLAINED	2.1
NAMING BASED ON	SUMMARIZING

This factor reflects a teacher who is student centered on his teaching. This tendency shows in the way the teacher listens to students' ideas and incorporates them into the lesson. He asks for suggestions from his students and guides them in using a wide array of verbal communication skills which require higher-order thinking.

FACTOR 7 "GROUP ACTIVITY ORIENTED"	
NUMBER OF HIGH LOADING VARIABLES	5
HIGHEST LOADING VARIABLE	VAR 95, LOADING .721
PERCENTAGE OF VARIANCE EXPLAINED	1.9
NAMING BASED ON	SUMMARIZING

In this factor the emphasis is on the different group activities the teacher involves his students in. The teacher participates in these activities himself and encourages the students to assist each other in learning activities. Such a teacher values co-operation and avoids negative competition.

FACTOR 8 "GOAL-ORIENTED"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 12, LOADING .738
PERCENTAGE OF VARIANCE EXPLAINED	1.8
NAMING BASED ON	SUMMARIZING

This factor reflects a goal-oriented teacher who informs his students of the objectives of the learning task in advance. He helps his students to define realistic self-developmental goals for themselves.

FACTOR 9 "CLARITY OF COMMUNICATION"	
NUMBER OF HIGH LOADING VARIABLES	6
HIGHEST LOADING VARIABLE	VAR 31, LOADING -.705
PERCENTAGE OF VARIANCE EXPLAINED	1.6
NAMING BASED ON	SUMMARIZING

This factor reflects clarity of communication. This is evident in two of the variables (9 and 36) which refer directly to clarity of communication. The rest of the variables support this view with other aspects that affect clear communication such as maintaining the eye contact and listening attentively in verbal communication .

FACTOR 10 "ORGANIZED"	
NUMBER OF HIGH LOADING VARIABLES	5
HIGHEST LOADING VARIABLE	VAR 94, LOADING .753
PERCENTAGE OF VARIANCE EXPLAINED	1.6
NAMING BASED ON	SUMMARIZING

This factor reflects a well prepared, organized teacher. An organized teacher has all the materials ready for the lesson and for the students in case they need them. The teaching proceeds with a smooth flow of events and minimum of time is spent on shifting from one activity to another.

FACTOR 11 "USE OF STIMULATING METHODS"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 51, LOADING .720
PERCENTAGE OF VARIANCE EXPLAINED	1.5
NAMING BASED ON	SUMMARIZING

This factor reflects a stimulating teacher who uses written innovative materials, furniture and his own body language to stimulate and interest the students. It is evident that he enjoys teaching and is truly excited about the subject matter to be taught.

FACTOR 12 "MULTI-STYLE TEACHING"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 51, LOADING .671
PERCENTAGE OF VARIANCE EXPLAINED	1.3
NAMING BASED ON	SUMMARIZING

Another facet of stimulating teaching behavior is reflected in this factor (see the description of factor 11). Here the teacher is providing a variety of distinct styles to present subject matter and in that way succeeds in avoiding dull routine in his teaching behavior.

FACTOR 13 "STUDENTS' THINKING PROVOKING"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 46, LOADING -.656
PERCENTAGE OF VARIANCE EXPLAINED	1.1
NAMING BASED ON	SUMMARIZING

In this factor a variety of questioning techniques are highlighted with the goal of provoking different levels of thinking on the part of students. The teacher uses open-ended questions, encourages alternative answers and adjusts the pace of questioning to reach this ultimate goal.

FACTOR 14 "STUDENTS' NEEDS ADAPTIVE"	
NUMBER OF HIGH LOADING VARIABLES	2
HIGHEST LOADING VARIABLE	VAR 17, LOADING .659
PERCENTAGE OF VARIANCE EXPLAINED	1.1
NAMING BASED ON	SUMMARIZING

This is a difficult factor to interpret with a low alpha (.425) value. The two associated variables seem to describe adaptability to student needs and its effect on teaching behavior. However, this factor belongs to the category of dimensions which do not have a natural interpretation.

FACTOR 15 "EXTERNAL SOURCES INTEGRATIVE"	
NUMBER OF HIGH LOADING VARIABLES	2
HIGHEST LOADING VARIABLE	VAR 48, LOADING -.636
PERCENTAGE OF VARIANCE EXPLAINED	1.0
NAMING BASED ON	SUMMARIZING

This small factor reflects the use of audio-visual and other equipment as a part of teaching.

FACTOR 16 "FLEXIBILITY"	
NUMBER OF HIGH LOADING VARIABLES	3
HIGHEST LOADING VARIABLE	VAR 70, LOADING .810
PERCENTAGE OF VARIANCE EXPLAINED	1.0
NAMING BASED ON	SUMMARIZING

This factor reflects a flexible teacher, who can change plans spontaneously when needed. The behavior description in variables shows adaptability without sacrificing organized planning with the goal of showing connections between the things learned and the real world.

FACTOR 17 "UNLABELED "	
NUMBER OF HIGH LOADING VARIABLES	3
HIGHEST LOADING VARIABLE	VAR 79, LOADING .603
PERCENTAGE OF VARIANCE EXPLAINED	1.0
NAMING BASED ON	SUMMARIZING

This factor has no clear interpretation, all the variables with high loadings representing seemingly unrelated concepts.

FACTOR 18 "PERSONAL FRIENDLINESS "	
NUMBER OF HIGH LOADING VARIABLES	7
HIGHEST LOADING VARIABLE	VAR 27, LOADING .696
PERCENTAGE OF VARIANCE EXPLAINED	0.9
NAMING BASED ON	SUMMARIZING

This factor reflects a friendly, outgoing teacher who wants to interact personally with all his students. He shares personal experiences, tells jokes and smiles to make the classroom climate open and personal.

7.4. FACTOR ANALYSIS RESULTS FOR THE FINNISH DATA

The chosen 18 factor solution explained 57.3% of the total variance. Both the Kaiser-Meyer-Olkin measure (.817) and the Bartlett test of sphericity (10041, significance .000) indicate that enough covariance was present to justify factor analysis. The interitem consistency for the factors was high, as the Cronbach alpha values in Figure 7.3. illustrate.

FACTOR 1 "PROJECT-BASED INTEGRATIVE "	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 90, LOADING .770
PERCENTAGE OF VARIANCE EXPLAINED	24.5
NAMING BASED ON	SUMMARIZING

This factor reflects a teacher who arranges different projects for the students to provide them opportunities for out-of-classroom learning. It is related to factors describing personal teaching behavior (e.g., factor 2) as can be seen from the second order factorization. Such projects include laboratory experiments, games, action research, etc.

FACTOR 2 "PERSONALITY BASED "	
NUMBER OF HIGH LOADING VARIABLES	6
HIGHEST LOADING VARIABLE	VAR 64, LOADING .709
PERCENTAGE OF VARIANCE EXPLAINED	6.8
NAMING BASED ON	HIGHEST LOADING

This factor reflects a teacher who puts his own personality into the teaching process and uses it as an instrument in teaching. He shares personal experiences, and shows warmth by smiling and maintaining the eye contact with students when speaking. Unplanned events in the classroom do not embarrass him, since he uses them to reinforce or illustrate the subject matter.

FACTOR 1: PROJECT-BASED INTEGRATIVE	.831
FACTOR 2: PERSONALITY BASED	.792
FACTOR 3: ORGANIZED COMMUNICATION	.729
FACTOR 4: TIME-ON-TASK	.745
FACTOR 5: EMPHATIC	.719
FACTOR 6: EXCITING	.800
FACTOR 7: ENCOURAGING	.773
FACTOR 8: STUDENTS' PERSONAL AFFAIRS ORIENTED	.628
FACTOR 9: PERFORMANCE INTEGRATIVE	.612
FACTOR 10: USE OF STIMULATING METHODS	.741
FACTOR 11: INTERACTION GUIDING	.723
FACTOR 12: GOAL-ORIENTED	.757
FACTOR 13: PROGRESS ASSURING VERBALITY	.727
FACTOR 14: STUDENTS' INTERESTS CONSIDERING	.740
FACTOR 15: UNLABELED	.412
FACTOR 16: STUDENTS' THINKING PROVOKING	.704
FACTOR 17: EXTERNAL SOURCES INTEGRATIVE	.816
FACTOR 18: INDIVIDUALLY ORIENTED	.765

Figure 7.3. The Cronbach alpha values for the factors in the Finnish data.

FACTOR 3 "ORGANIZED COMMUNICATION"	
NUMBER OF HIGH LOADING VARIABLES	6
HIGHEST LOADING VARIABLE	VAR 9, LOADING .729
PERCENTAGE OF VARIANCE EXPLAINED	3.1
NAMING BASED ON	SUMMARIZING

This factor emphasizes verbal communication skills. These skills include clarity in speech; the communication must be clear since the students need to understand the language the teacher is using. The teacher is also very organized in his communication, teaching flows smoothly and his attention is balanced between different kinds of students.

FACTOR 4 "TIME-ON-TASK"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 10, LOADING -.624
PERCENTAGE OF VARIANCE EXPLAINED	2.7
NAMING BASED ON	SUMMARIZING

The emphasis in this factor is on academic learning time. The teacher arranges activities for those students who are faster than the others to keep them on task. Depending on the situation the teacher can arrange the students to work individually or direct them in assisting each other to assure task completion. The needs of students are acknowledged in planning the activities by adjusting the time frames.

FACTOR 5 "EMPHATIC"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 96, LOADING .601
PERCENTAGE OF VARIANCE EXPLAINED	2.5
NAMING BASED ON	SUMMARIZING

This factor reflects an emphatic teacher, who is concerned for his students in many ways and demonstrates this both verbally and non-verbally.

FACTOR 6 "EXCITING"	
NUMBER OF HIGH LOADING VARIABLES	5
HIGHEST LOADING VARIABLE	VAR 65, LOADING -.748
PERCENTAGE OF VARIANCE EXPLAINED	2.1
NAMING BASED ON	SUMMARIZING

This factor reflects an exciting, interesting teacher, who is also imaginative and stimulating. The teacher communicates these qualities with his body movements and verbal communication.

FACTOR 7 "ENCOURAGING"	
NUMBER OF HIGH LOADING VARIABLES	6
HIGHEST LOADING VARIABLE	VAR 8, LOADING .740
PERCENTAGE OF VARIANCE EXPLAINED	1.8
NAMING BASED ON	SUMMARIZING

In this factor an encouraging teacher is reflected. The teacher encourages his students by verbal communication and by giving an opportunity to share thoughts and feelings. The climate in the classroom is warm and the teacher avoids embarrassing his students.

FACTOR 8 "STUDENTS' PERSONAL AFFAIRS ORIENTED"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 27, LOADING .741
PERCENTAGE OF VARIANCE EXPLAINED	1.7
NAMING BASED ON	SUMMARIZING

This factor emphasizes an outgoing teacher who tells and listens to jokes and amusing incidents. Joking is not the primary interest, but serves his purpose in building a good relationship with his students to make it possible for them to communicate more personal matters to the teacher. This way the teacher makes the students feel accepted and provides tutorial assistance when needed.

FACTOR 9 "PERFORMANCE INTEGRATIVE"	
NUMBER OF HIGH LOADING VARIABLES	3
HIGHEST LOADING VARIABLE	VAR 95, LOADING .433
PERCENTAGE OF VARIANCE EXPLAINED	1.6
NAMING BASED ON	SUMMARIZING

This factor emphasizes learning activities that involve performing for example role-plays and socio-dramas. For such activities interaction is seen as very important and the teacher integrates activities with a high degree of student interaction in the classroom.

FACTOR 10 "USE OF STIMULATING METHODS"	
NUMBER OF HIGH LOADING VARIABLES	6
HIGHEST LOADING VARIABLE	VAR 59, LOADING .762
PERCENTAGE OF VARIANCE EXPLAINED	1.5
NAMING BASED ON	SUMMARIZING

A teacher using different stimulating methods is highlighted in this factor. The teacher needs to be well-prepared to be able to organize subject matter presentations or to use self-invented materials in the classroom. The teacher makes an effort to stimulate and interest the students by improvising furniture, costumes and classroom decoration.

FACTOR 11 "INTERACTION GUIDING"	
NUMBER OF HIGH LOADING VARIABLES	3
HIGHEST LOADING VARIABLE	VAR 39, LOADING -.728
PERCENTAGE OF VARIANCE EXPLAINED	1.4
NAMING BASED ON	SUMMARIZING

Verbal interaction is highlighted in this factor. The climate in the classroom needs to be supportive and the teacher needs to encourage student responses to make the interaction work. The teacher can guide the interaction by adjusting his questions and giving the students enough time to think before answering.

FACTOR 12 "GOAL-ORIENTED"	
NUMBER OF HIGH LOADING VARIABLES	5
HIGHEST LOADING VARIABLE	VAR 39, LOADING .627
PERCENTAGE OF VARIANCE EXPLAINED	1.3
NAMING BASED ON	SUMMARIZING

This factor reflects a goal-oriented teacher. The students are informed of the objectives of his lesson and these objectives are presented before anything is done. The teacher plans everything well in advance and the plans reflect his goals.

FACTOR 13 "PROGRESS ASSURING VERBALITY"	
NUMBER OF HIGH LOADING VARIABLES	5
HIGHEST LOADING VARIABLE	VAR 102, LOADING -.748
PERCENTAGE OF VARIANCE EXPLAINED	1.2
NAMING BASED ON	SUMMARIZING

The interpretation of this factor is not clear. The highest loading variable emphasizes verbal questioning techniques. Similarly variable 83 mentions verbal techniques. Other variables deal with teaching materials and their availability during the activity. The use of questioning techniques and teaching materials can be interpreted as ways to assure progress in student learning.

FACTOR 14 "STUDENTS' INTERESTS CONSIDERING"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 54, LOADING .710
PERCENTAGE OF VARIANCE EXPLAINED	1.2
NAMING BASED ON	SUMMARIZING

This factor reflects a student-centered teacher who listens to their ideas using them in the lesson. He provides them choices in the learning activities and also guides them to use higher cognitive operations.

FACTOR 15 "UNLABELED"	
NUMBER OF HIGH LOADING VARIABLES	2
HIGHEST LOADING VARIABLE	VAR 22, LOADING .695
PERCENTAGE OF VARIANCE EXPLAINED	1.1
NAMING BASED ON	SUMMARIZING

This factor has no interpretation with its two variable loadings (conflicting signs).

FACTOR 16 "STUDENTS' THINKING PROVOKING"	
NUMBER OF HIGH LOADING VARIABLES	3
HIGHEST LOADING VARIABLE	VAR 45, LOADING .746
PERCENTAGE OF VARIANCE EXPLAINED	1.0
NAMING BASED ON	SUMMARIZING

This factor reflects a teacher who uses questioning techniques to provoke his students to think. He asks for suggestions from his students and encourages alternative answers to support different levels of thinking on the part of all students.

FACTOR 17 "EXTERNAL SOURCES INTEGRATIVE"	
NUMBER OF HIGH LOADING VARIABLES	6
HIGHEST LOADING VARIABLE	VAR 48, LOADING .829
PERCENTAGE OF VARIANCE EXPLAINED	0.9
NAMING BASED ON	SUMMARIZING

This factor emphasizes the use of a variety of teaching materials including audio-visual equipment regularly as a part of a lesson. The purpose for using such external sources in the classroom is to make learning challenging and interesting to the students.

FACTOR 18 "INDIVIDUALLY ORIENTED"	
NUMBER OF HIGH LOADING VARIABLES	6
HIGHEST LOADING VARIABLE	VAR 58, LOADING .512
PERCENTAGE OF VARIANCE EXPLAINED	0.9
NAMING BASED ON	SUMMARIZING

All the variables in this factor except variable 5 "I accept disagreements" have a clear emphasis on the individual needs of the students.

7.5. SECOND ORDER FACTORIZATION

7.5.1. SECOND ORDER FACTORS FOR THE US DATA

The chosen 4 factor solution explained 30.4% of the variance. For the second order factors we exceptionally also report the high loading primary factors.

2ND ORDER FACTOR 1 "INDIVIDUALLY STIMULATING"	
NUMBER OF HIGH LOADING FACTORS	7
HIGHEST LOADING FACTOR	FACTOR 16, LOADING .592
PERCENTAGE OF VARIANCE EXPLAINED	19.6
NAMING BASED ON	SUMMARIZING

HIGH LOADING FACTORS	
16	Flexibility (.592)
7	Group Activity Oriented (.587)
1	Individually Oriented(.538)
13	Students' Thinking Provoking (.435)
6	Students' Interests Considering (-.349)
11	Use of Stimulating Methods (.438)
12	Multi-Style Teaching (.419)

This second order factor is a composite of 7 primary factors. The factor was named "Individually Stimulating" as the high loading primary factors focus on either issues related to individualized teaching ("Individually Oriented"(.538), "Group Activity Oriented" (.587) etc.) and stimulating teaching behavior ("Use of Stimulating Methods" (.438), "Multi-Style Teaching" (.419)). This view is also supported by inspecting the correlations at the variable level, where individual variables such as variable 63 "I utilize activities which allow for a high degree of student interaction - discussion, simulation, experiments, problem solving, games, inquiries" (.699) and variable 58 "I use diagnostic information about individuals' current needs in lesson planning" (.660) confirm the interpretation. With respect to the Harris components this factor is a mixture of behaviors from the Harris components "Stimulating", "Verbally Interactive", "Multi-Media Integrative" and "Individually Oriented".

2ND ORDER FACTOR 2 "ORGANIZED"	
NUMBER OF HIGH LOADING FACTORS	2
HIGHEST LOADING FACTOR	FACTOR 10, LOADING .468
PERCENTAGE OF VARIANCE EXPLAINED	4.4
NAMING BASED ON	HIGHEST LOADING

HIGH LOADING FACTORS
10 Organized (.468) 2 Project-Based Integrative (.430)

This small second order factor is a composite of 2 primary factors. The factor was named "Organized" because both primary factors reflected organized teaching behavior. The other primary factor "Project-Based Integrative" was interpreted as indicating organized teaching behavior because the teacher needs to be organized to be able to arrange project-based work with his students. This view is also supported by inspecting the correlations at the variable level, where individual variables such as variable 15 "I organize classroom activities to produce a smooth flow of events with a minimum of confusion or waste of time" (.535) and variable 90 "I arrange for laboratory experiments, special projects, or action research studies as a part of regular assignments" (-.550) confirm the interpretation. At the variable level clear communication skills such as variable 36 "I communicate clearly" (.482) have high correlation with this second order factor. This is very reasonable because clear communication can be understood as necessary for organized teaching behavior. With respect to the Harris components this factor consists of two Harris components: Businesslike and Verbally Interactive. The former clearly supports the interpretation of this factor as organized teacher behavior is a subcomponent of the general Businesslike component.

2ND ORDER FACTOR 3 "EXCITING"	
NUMBER OF HIGH LOADING FACTORS	6
HIGHEST LOADING FACTOR	FACTOR 18, LOADING -.530
PERCENTAGE OF VARIANCE EXPLAINED	3.7
NAMING BASED ON	HIGHEST POSITIVE LOADING

HIGH LOADING FACTORS	
3	Exciting (.504)
15	External Sources Integrative (.469)
18	Personal Friendliness (-.530)
11	Use Of Stimulating Methods (-.424)
12	Multi-Style Teaching (-.367)
7	Group Activity Oriented (-.300)

This second order factor is a composite of 6 primary factors. The factor was named "Exciting" according to the highest positive loading primary factor and the second highest positive loading primary factor suggesting this interpretation. It seems very evident that an exciting teacher uses different teaching methods and help from external sources to stimulate his students. This view is also supported by inspecting the correlations at the variable level, where individual variables such as variable 82 "I am an exciting teacher" (-.663) and variable 48 "I use a variety of audio-visual and manipulative aids regularly as integral parts of lessons and assignments " (-.688) confirm the interpretation. With respect to the Harris components this factor is a mixture of behaviors from Harris components Stimulating, Friendly and Multi-Media Integrative. However, the component Stimulating is the dominant one, as the interpretation "Exciting" indicates.

2ND ORDER FACTOR 4 "EMPHATICALLY COMMUNICATIVE"	
NUMBER OF HIGH LOADING FACTORS	8
HIGHEST LOADING FACTOR	FACTOR 5, LOADING -.591
PERCENTAGE OF VARIANCE EXPLAINED	2.7
NAMING BASED ON	SUMMARIZING

HIGH LOADING FACTORS	
9	Clarity Of Communication (.502)
4	Emphatic (.451)
13	Students' Thinking Provoking (.304)
5	Time-On-Task (-.591)
18	Personal Friendliness (-.444)
16	Flexibility (-.401)
1	Individually Oriented (-.395)
10	Organized (-.393)

This second order factor is a composite of 8 primary factors. The factor was named "Emphatically Communicative" as the high positive loading primary factors focus either on issues related to communication skills or emphatic teaching behavior. This view is also supported by inspecting the correlations at the variable level, where individual variables such as variable 75 "I provide for and process feedback to individuals about class activities and homework assignments, adjusting instructional modes, materials, or time on task if needed" (-.662) and variable 25 "I express interest in individuals as persons over and above being students" (-.660) confirm the interpretation. With respect to the Harris components this factor is a mixture of Harris components Friendly, Individually Oriented and Verbally Interactive, the first one being clearly dominant.

The full second order factor structure for the US data is illustrated in Figure 7.4. As depicted in the Figure, three primary factors did not contribute to the structure at all. The factor scores of two of these primary factors, the unlabeled one and the factor "Students' Needs Adaptive" were left out of the analysis, since both of these factors were very unclear and difficult to interpret. The primary factor "Goal Oriented" did not exhibit high loadings on any of the factors.

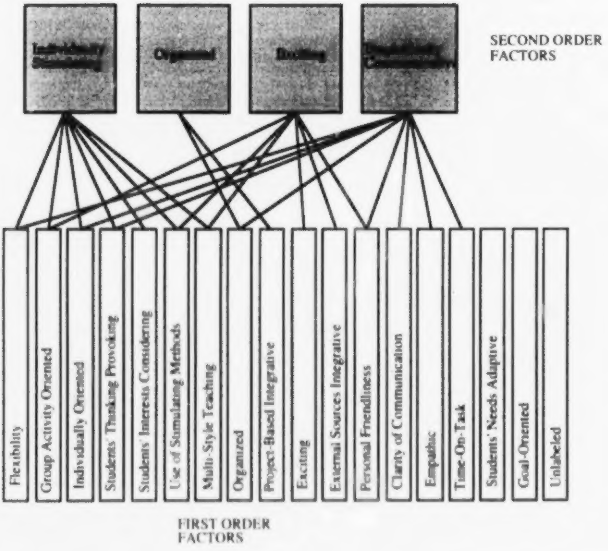
Organized
Exciting
SECOND ORDER FACTORS
Flexibility
Group Activity Oriented
Individually Oriented
Students' Thinking Provoking
Students' Interests Considering
Use of Stimulating Methods
Multi-Style Teaching
Organized
Project-Based Integrative
Exciting
External Sources Integrative
Personal Friendliness
Clarity of Communication
Empathic
Time-On-Task
Students' Needs Adaptive
Goal-Oriented
Unlabeled
FIRST ORDER FACTORS

Figure 7.4. The second order factor structure for the US data. Grouping of the primary factors is denoted by lines.

7.5.2. SECOND ORDER FACTORS FOR THE FINNISH DATA

The 5 factor solution chosen explained 31.6% of the variance.

2ND ORDER FACTOR 1 "STUDENTS' PERSONALITY CENTERED"	
NUMBER OF HIGH LOADING FACTORS	7
HIGHEST LOADING FACTOR	FACTOR 13, LOADING .-519
PERCENTAGE OF VARIANCE EXPLAINED	17.3
NAMING BASED ON	SUMMARIZING

HIGH LOADING FACTORS	
13	Progress Assuring Verbality (-.519)
6	Exciting (-.323)
11	Interaction Guiding (-.304)
14	Students' Interests Considering (.501)
16	Students Thinking Provoking (.485)
2	Personality Based (.477)
8	Students' Personal Affairs Oriented .(444)

This second order factor is a composite of 7 primary factors. The factor was named "Students' Personality Centered" as the positively high loading primary factors all focus on issues related to students' personalities. This view is also supported by inspecting the correlations at the variable level, where individual variables such as variable 55 "I listen to students' ideas, incorporating them into the lesson and recognizing their worth" (.600) and variable 64 "I share personal experiences" (.611) confirm the interpretation. By sharing his own personal experiences the teacher sets an example to his students and makes the classroom atmosphere favorable to revealing one's personal interests and preferences. This factor is a mixture of behaviors from the Harris components Stimulating, Friendly and Verbally Interactive, all of which emphasize taking into account the student's personal affairs.

2ND ORDER FACTOR 2 "ENCOURAGING"	
NUMBER OF HIGH LOADING FACTORS	3
HIGHEST LOADING FACTOR	FACTOR 11, LOADING -.537
PERCENTAGE OF VARIANCE EXPLAINED	5.7
NAMING BASED ON	SUMMARIZING

HIGH LOADING FACTORS
11 Interaction Guiding (-.537) 7 Encouraging (.509) 8 Students' Personal Affairs Oriented (.401)

This second order factor is a composite of 3 primary factors. The factor was named "Encouraging" according to the highest positive loading primary factor and the other positive loading primary factor supporting this interpretation. An encouraging teacher needs to be concerned about his students' personal affairs to be able to encourage each individual student in the right way. This view is also supported by inspecting the correlations at the variable level, where individual variables such as variable 8 "I am an encouraging teacher" (.611) and variable 25 "I express interest in individuals as persons over and above being students" (.614) confirm this interpretation. This factor is a mixture of behaviors from the Harris components Friendly and Verbally Interactive.

2ND ORDER FACTOR 3 "EMPHATIC"	
NUMBER OF HIGH LOADING FACTORS	6
HIGHEST LOADING FACTOR	FACTOR 5, LOADING .692
PERCENTAGE OF VARIANCE EXPLAINED	3.6
NAMING BASED ON	HIGHEST LOADING

HIGH LOADING FACTORS
5 Emphatic (.692) 2 Personality Based .(337) 1 Project-Based Integrative (.272) 9 Performance Integrative (.233) 13 Progress Assuring Verbality (-.576) 11 Interaction Guiding (-.282)

This second order factor is a composite of 6 primary factors. The factor was named "Emphatic" as the two highest positive loading primary factors focus on emphatic and personality oriented teaching behavior. This view is also supported by inspecting the correlations at the variable level, where individual variables such as variable 99 "I reflect empathy, concern, and warm liking of students as related to both school and other aspects of life" (.653) and variable 33 "I am an empathetic teacher" (.543) confirm the interpretation. With respect to the Harris components, this factor is a balanced mixture of behaviors from the Harris components Friendly, Verbally Interactive and Businesslike.

2ND ORDER FACTOR 4 "STUDENTS' LEARNING ADAPTIVE"	
NUMBER OF HIGH LOADING FACTORS	3
HIGHEST LOADING FACTOR	FACTOR 4, LOADING .629
PERCENTAGE OF VARIANCE EXPLAINED	3.1
NAMING BASED ON	SUMMARIZING

HIGH LOADING FACTORS	
4	Time-On Task (.629)
18	Individually Oriented (.420)
12	Goal-Oriented (-.451)

This second order factor is a composite of 3 primary factors. The factor was named "Students' Learning Adaptive" as the two high positive loading primary factors focus either on issues related to individualized teaching or academic learning time. We interpreted these tendencies as a trend to providing the students with teaching which acknowledges individual differences in the main goal of producing as much academic learning in students as possible. This view is also supported by inspecting the correlations at the variable level, where individual variables such as variable 10 "I initiate changes in activity for individuals who are ready while others are still busy with prior assignments" (-.668) confirm the interpretation. This factor is a mixture of behaviors from Harris components Businesslike, Stimulating and Individually Oriented.

2ND ORDER FACTOR 5 "MULTI-MEDIA INTEGRATIVE"	
NUMBER OF HIGH LOADING FACTORS	3
HIGHEST LOADING FACTOR	FACTOR 17, LOADING .676
PERCENTAGE OF VARIANCE EXPLAINED	1.8
NAMING BASED ON	SUMMARIZING

HIGH LOADING FACTORS	
17	External Sources Integrative (.676)
1	Project-Based Integrative (.495)
10	Use Of Stimulating Methods (.445)

This second order factor is a composite of 3 primary factors. The factor was named "Multi-Media Integrative" as all the high loading primary factors focus on using different sources and methods in teaching. This view is also supported by inspecting the correlations at the variable level, where individual variables such as variable 92 "I utilize teacher-made as well as commercial and student-made materials in the classroom" (.742) and variable 48 "I use a variety of audio-visual and manipulative aids regularly as integral parts of lessons and assignments" (.736) confirm the interpretation. With respect to the Harris components this factor is a mixture of behaviors from the Harris components Multi-Media Integrative and Stimulating, the former being dominant as suggested by the interpretation.

The full second order factor structure for the Finnish data is illustrated in Figure 7.5. As depicted in the Figure, two primary factors did not contribute to the structure at all. As in the US data also, the factor score of the primary factor that could not be interpreted was left out of the analysis, and the primary factor "Organized Communication" did not exhibit high loadings on any of the factors.

7.6. FACTOR STRUCTURE COMPARISON

In the previous sections we have performed exploratory analysis of the dimensions of teacher classroom behavior as implied by our data. Some similarities in the primary factor structure were observed by an informal visual inspection, as would be expected if the Harris model components are universal. However, since the relationship of the two structures seems by no means obvious, we proceed by exploring more rigorous methods in comparing the factor structures. This brings us to the general problem of relating factors between studies, and especially to the case where the studies are based on the same variables but upon different individuals.

In the literature several procedures for measuring the relatedness of factors have been suggested. The most commonly applied comparison method is to calculate the coefficient of congruence (Harman 1976, pp. 341-345). Although quite frequently used, the coefficient of congruence suffers from problems such as being highly sensitive to the sign and level of the loadings. Here we are more interested in comparing pattern similarities than magnitude similarities. In case of orthogonal components, calculating the coefficient of congruence is identical to correlating the exact factor scores (Gorsuch 1983, pp.285). Using it for correlated components such as the factors produced by oblique rotations is questionable. Another common alternative is to resort to likelihood estimators such as Cattell's salient similarity index (Cattell & Baggaley 1960), and estimate the likelihood that the structures have coinciding high loadings (Rummel 1970, pp 463). However, these indicators compare the factors as given and do not use the full information available in the structure matrices, which could be used to compensate for the specific variances, etc.

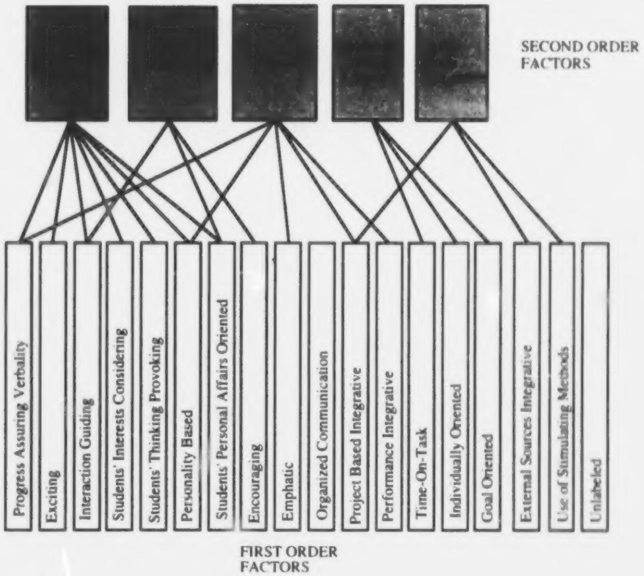
SECOND ORDER FACTORS
Progress Assuring Verbality
Exciting
Interaction Guiding
Students' Interests Considering
Students' Thinking Provoking
Personality Based
Students' Personal Affairs Oriented
Encouraging
Emphatic
Organized Communication
Project Based Integrative
Performance Integrative
Time-On-Task
Individually Oriented
Goal Oriented
External Sources Integrative
Use of Stimulating Methods
Unlabeled
FIRST ORDER FACTORS

Figure 7.5. The second order factor structure for the Finnish data.

In more sophisticated approaches preprocessing by rotation improves the subsequent comparison results. Both the transformation analysis of Ahmavaara (1954) and the projection method of Kaiser, Hunka and Bianchini (Kaiser et al 1971) are based on such a rotation to a least square fit. These methods are closely related, although they differ in some technical details. Here we have chosen the Kaiser, Hunka and Bianchini approach, as the computational procedure is also suitable for studying the oblique solutions on which the previous analysis phases are based. The computer program to perform the projection-based comparison, FACTREL, has been distributed only very recently (Fleming 1992) and had to be slightly modified to fit to our large number of variables.

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Full description of the procedure is outside the scope of this thesis, and can be found in (Kaiser et al 1971). Intuitively the method is based on projecting the variables into the common variable space, and rotating the second variable set so that the sum of inner products of the variable pairs is maximized. Since factor positions can be identified as functions of the variables, the factors in the second study can then be projected into this space. From such a projection the cosines of the angles between the two set of factors are considered, as they approximate the factor correlation.[7]

Before describing the factor relationships revealed by the procedure, it should be pointed out that the procedure also has an elegant indicator for the quality of the fit, the mean cosine between the variable pairs. This mean cosine in our case is .747, which can be considered to be reasonable (anything above .9 can be considered excellent). Similarly a low value in individual variable pair cosines indicates a poor match between the variables; i.e., that variables do not measure the same underlying phenomenon. In our case the comparison supported the hypothesis that some of the variables seem to be understood differently by American and Finnish teachers. This is indicated by the low cosine value for the variables below, many of which have already been problematic in the previous analysis phases. Consequently we will also briefly discuss the ten highest and lowest scoring variables in the projection procedure at the end of this section.

Figure 7.6 depicts the relationships between the factors (factor pairs and the corresponding cosines) in the Finnish and US data in descending cosine value order. The pairing procedure is simple; in general, we have just chosen the pair for a factor in one study by relating it to the highest cosine value factor in the other study. The solution was almost an one-to-one pairing with three exceptions, in which cases, to achieve a one-to-one mapping, the second or third highest cosine value factor had to be chosen. The close relationship between the factor structures is evident as 12 clear factor pairs can be identified. Methodologically it is also interesting to notice that the semantically close factors could have cosine values as low as .550. For the reasons above, we can argue that this comparison analysis enhances the more informal conclusions of the earlier phases; both of the data sets indicating the existence of at least partially similar underlying abstract structures measured by the variables.

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[7] Between studies the cosines are not true correlations as there are no common individuals on which to base a correlation, however they represent a measure that can be interpreted in the same way as a correlation coefficient (Kaiser, Hunka and Bianchini 1971).

Finnish Data	cosine	USA Data
Exciting	.866	Exciting
Project Based Integrative	-.813	Project Based Integrative
Progress Assuring Verbality	.794	Students' Thinking Provoking
Students' Personal Affairs Oriented	.763	Personal Friendliness
Goal Oriented	.730	Goal Oriented
External Sources Integrative	-.710	External Sources Integrative
Organized Communication	.707	Organized
Students' Interests Considering	.677	Students' Interests Considering
Time-On-Task	-.603	Time-On-Task
Use of Stimulating Methods	.593	Use of Stimulating Methods
Interaction Guiding	-.564	Flexibility
Encouraging	-.548	Clarity of Communication
Personality Based	.539	Individually Oriented
Students' Thinking Provoking	.509	Multi-Style Teaching
Performance Integrative	.487	Group Activity Oriented
Emphatic	-.462	Emphatic
Individually Oriented	-.430	Students' Needs Adaptive

Figure 7.6. The pairing of related factors in the US and Finnish data. The values in the middle are the factor cosines for the pairs as calculated by the Kaiser, Hunka and Bianchini method.

Although the main purpose of the projection-based analysis is to relate the factors from the two studies, it is also interesting to briefly look at the variable level cosine values. As indicated above, a high mean value for the variable pair cosines is essential to the reliability of the procedure, but identification of the high and low scoring pairs yields interesting information about the cross-data validity of the variables in question. The high-scoring variables are similarly related in both data sets, and the low-scoring variables differ considerably from one data set to the other in their relationship with other variables.

Ten highest cosine variable pairs (in descending order):

90 I arrange for laboratory experiments, special projects, or action research studies as a part of regular assignments 0.954
48 I use a variety of audio-visual and manipulative aids regularly as integral parts of lessons and assignments 0.911
36 I communicate clearly 0.908
47 I am an imaginative teacher 0.905
87 I structure discussion groups to provide extended opportunities for students to verbalize and share knowledge with each other 0.893
75 I provide for and process feedback to individuals about class activities and homework assignments, adjusting instructional modes, materials, or time on task if needed 0.889
15 I organize classroom activities to produce a smooth flow of events with a minimum of confusion or waste of time 0.885
52 I demonstrate interest and concern for students nonverbally in a variety of ways 0.883
18 I give clear, simple directions for shifting from one activity to another 0.881
20 I speak to students in encouraging way 0.873

It seems that the variables with the most similar relationships share features of being clearly understandable independently of the cultural background differences. Therefore variables from the Harris component "Multi-Media Integrative" (variables 90, 48 and 87) with clear descriptions of behaviors using various types of equipment, and the component "Businesslike" (variables 15 and 18) with time-efficient descriptions seem to be understood similarly across the studies.

Ten lowest cosine variable pairs (in ascending order):

22 I avoid giving negative reactions, criticisms, threats, sarcasm, etc. 0.454
23 I interact personally with all students, balancing the attention given more aggressive and the less aggressive students 0.485
37 I use a level of language students can understand 0.510
5 I accept disagreements 0.530
4 I inquire about students' personal accomplishments or interests 0.542
62 I am well prepared for my classes 0.564
19 I use with, and accept from, students such physical contacts as handshakes or pats on the back 0.576
79 I decorate or arrange the classroom in ways which reinforce the theme of the lesson or the subject 0.585
34 I free students from embarrassment by using reassuring and supportive statements 0.600
73 I utilize print materials which are illustrated and colorful 0.619

The low-scoring variable set contains variables which seem to suffer from being differently understood, either due to translation problems or more deep differences in understanding the natural language description. It is interesting to observe that the two variables (variables 22 and 5) supposedly measuring a teacher's ability to avoid negative feedback are among the lowest cosines. Both of these variables have already presented difficulties during the previous analysis phases; for example, variable 5 formed a factor of its own in the Finnish data analysis.

7.7. CROSS-CULTURALITY AS A DISCRIMINATING FACTOR

In the discussion above we have indications of general structural similarities across the US and Finnish data sets (structure comparison results of Section 7.6) as well as evidence of the dissimilarities of the two data sets with respect to the Harris model (Chapter 6 results). Here we progress by performing a discriminant analysis for the complete data set in order to identify discriminating factors from the primary factor structure identified. Instead of just investigating discrimination between American and Finnish teachers, we have carried the analysis slightly further and also attempted to discover discriminators for the geographical and subject-specific dimensions. Thus for the discriminant analysis the data was divided into four mutually exclusive groups: Indiana teachers, Texan teachers, Finnish teachers evaluating their teaching behavior in a general setting and Finnish teachers evaluating their teaching behavior in a subject-specific context (religious education).

The detailed results are reported in the table presented in Figure 7.7. By the indicators involved, such as η^2 and Wilks's lambda (Klecka 1981, pp. 36-39), the set of functions identified functions is a good discriminator for the four groups involved (after the third functions Wilks's lambda value is .909). Finding good linear discriminators is usually not very difficult (unless the true discriminators are highly nonlinear), but finding ones with a meaningful semantic interpretation is much harder. In our case the functions, each of which also gives valuable information in our quest of exploring the effects of cultural background on measurement of effective teaching, were susceptible to an interpretation.

factor	FIN Data (x,s)	SS Data (x,s)	IN Data (x,s)	TX Data (x,s)	p<	η^2	Disc. f I	Disc. f II	Disc. f III
f1	-0.41,.83	-.93,.87	.56,.62	.63,.62	.001	.42	.46	-.12	-.02
f2	.01,.83	-.65,1.30	.30,.60	.28,.48	.001	.15	.22	.14	-.06
f3	-.05,.80	-.60,1.10	.20,.81	.32,.80	.001	.13	.20	.06	.12
f4	.43,.57	-1.10,1.21	.20,.49	.16,.59	.001	.36	.28	.50	-.09
f5	-.02,.79	-.77,1.24	.20,.62	.57,.57	.001	.25	.31	.02	.44
f6	-.34,.92	-.55,1.13	.39,.63	.53,.66	.001	.23	.28	-.13	.10
f7	.10,.89	-.58,.89	.18,.83	.16,1.04	.001	.09	.15	.14	-.06
f8	-.11,.80	-.65,1.1	.40,.62	.29,.74	.001	.18	.26	.03	-.22
f9	.26,.90	.42,1.35	-.41,.48	-.37,.54	.001	.15	-.22	.11	.12
f10	-.03,.79	-.80,1.1	.15,.66	.43,.72	.001	.22	.27	.12	.34
f11	-.39,.75	-.93,.95	.74,.51	.47,.58	.001	.45	.48	-.10	-.56
f12	.10,.69	-1.12,.86	.33,.73	.45,.68	.001	.38	.40	.27	.11
f13	-.79,.73	-.10,.89	.46,.54	.70,.46	.001	.46	.33	-.62	.28
f15	.01,.76	-1.13,1.10	.32,.56	.49,.55	.001	.38	.41	.22	.18
f16	-.03,.87	-.84,1.03	.22,.73	.46.64	.001	.24	.29	.11	.27
N	85	54	64	74					
Oa							3.34	1.22	.09
Oa%							71.16	26.2	2.1
khii							629	238	25.3
Rc2							.77	.55	.09

Figure 7.7. The results of the discriminant analysis. The column FIN represents Finnish teachers (general context), SS subject-specific teachers (religion education), IN Indiana teachers and TX Texan teachers.

Since we were searching for discrimination between four groups of individuals, the analysis resulted in three discriminating functions which we name "Dynamic" (Function 1), "Time-On-Task" (Function 2) and "Verbal Communication" (Function 3). Of these functions, Dynamic discriminates between the American and Finnish teachers, Time-On-Task between the Finnish teachers in the general setting and the subject-specific Finnish teachers, and Verbal Communication between the Indiana teachers and Texan teachers. We will now proceed by describing each of the functions by their corresponding high loading factors, and then the possible explanations as to why the factor components identified are discriminative. We report each of the discrimination functions analogously to the second order factorization in Section 7.5 together with the high loading factors.

DYNAMIC (Function 1)	
Finnish teachers	-.77
Subject-specific teachers.	-3.0
Indiana teachers	1.53
Texas teachers	1.74

HIGH LOADING FACTORS	
f1	Stimulating (.46)
f15	Flexibility (.41)
f12	Goal-Oriented (.40)
f16	External Sources Integrated. (.29)
f6	Organized Communication (.28)
f8	Students' Personal Affairs Oriented (.26)
f9	Encouraging (-.22)
f2	Interaction Guiding (.22)
f3	Students Thinking Provoking (.20)
f7	Project-Based Integrated (.15)

This was the most evident tendency with the US teachers and the least evident with subject specific Finnish teachers.

The most visible feature of both Texan and Indiana teachers is their dynamic teaching. Dynamic teaching is reflected in stimulating and flexible teaching behavior where external sources and projects are integrated in the regular teacher-centered classroom teaching. A dynamic teacher acknowledges students' personal affairs and interests and provokes students' thinking processes in many different ways.

The dynamic teaching behavior of American teachers is easily understood against the background of the ideas of the best known American educator, John Dewey (1957). He is known for his pragmatism and experimentalism which had great impact on his ideas of schooling. His concept of "learning by doing" in school what he sees as an active, dynamic society itself is influencing American teaching even today. According to Dewey teaching must grow out of the child's interests and the school must encourage creativity in the children. The classroom should be a laboratory-like environment where different projects are undertaken. Our study reflects this tendency of American teachers to aim at dynamic teaching behavior. This dynamic teaching can be interpreted according to Mallinson's concept (Mallinson 1961) as a national characteristic of American teachers. Although there is no general goal for education in the United States, if we wanted to create one according to Nurmi (1982, pp.98) it would be a liberated, equal, pragmatic and progressive person.

TIME-ON-TASK (Function 2)	
Finnish teachers	1.59
Subject-specific teachers.	-1.3
Indiana teachers	-.43
Texas teachers	-.5

HIGH LOADING FACTORS	
f13	Positively Organized (-.62)
f4	Time-On-Task (.50)

This was the most evident tendency for the Finnish teachers, and the least evident for the teachers of religious education (subject-specific teachers). A possible explanation for this discriminator is the academic reform tradition that has affected Finnish teacher education (see the discussion in Chapter 3). In the academic tradition the content knowledge of the academic subject is stressed, and the time spent on academic learning has been shown to produce most learning in students, as already pointed out in Chapter 5. It seems that the Finnish teachers want their students to master the academic goals that have been set for them in the curriculum following the same pattern as their own academically oriented education. Another additional explanation of this orientation is the strong influence of the Herbart-Ziller school at the beginning of the twentieth century. According to Nurmi the methods of the Herbart-Ziller school can still be seen in Finnish teaching practices (Nurmi 1982, pp.111). Finnish teachers tend to be very teacher-centered in their teaching behavior (Kansanen & Uusikylä 1982), as this has been shown to produce the most academic learning (see discussion in Chapter 5).

The tendency of Finnish teachers to spend most time on academic learning is also explained by the national curriculum in Finland. The curriculum sets universal goals that should be met by every teacher and most of the goals are academically oriented. In the United States education is considered to be the responsibility of the state and the curriculum contents differ in each of the 50 states. The same difference can also be seen in the teacher education programs in these two countries. Although differing from each other in their emphasis, the 10 teacher education departments in Finland have a lot in common with their national curriculum. On the other hand, in the United States the institutions, about 1300 in number, have no national curriculum but differ from each other in their standards and their methods.

The reason for the difference of the subject-specific religious education teachers from the other Finnish teachers is easily explained by the goals of such education, which emphasize affective, ethical and social considerations towards which a teacher should be concerned with (Anon.1987, pp.58-74). Such goals are not met by spending time on academic learning alone.

VERBAL COMMUNICATION (Function 3)	
Finnish teachers	.02
Subject-specific teachers	.01
Indiana teachers	-.5
Texas teachers	.4

HIGH LOADING FACTORS	
f11	Print Materials Integrated (-.56)
f5	Progress Assuring Verbality (.44)
f10	Verbal Friendliness (.34)

The greatest tendency to use verbal communication in their teaching is seen amons Texan teachers and, somewhat surprisingly, the Indiana teachers rank last in the use of verbal communication of all the four groups of teachers.

However, this difference between the American teachers from different states can be explained by the cultural differences between the American South and Midwest. Verbal communication is one of the areas in human interaction that is very culture specific. Teachers in Texas have a large portion of students from Mexican-American families who speak Spanish as their native language. These students have difficulties with spoken English and even more difficulties with written English. The Indiana teachers teach a much more homogenous group of students with less minority students in their classrooms (Bennett 1990, pp.229). This cultural difference explains the tendency for the southern teachers to concentrate on those verbal communication skills which also reach the students from high context cultures. In Indiana the majority of the students come from low context cultures and the written word is a reasonably effective way to reach these children who have no difficulties with the English language.[8]

Finally a small observation related to the data sample. Uncritical use of the discriminant analysis can easily lead to misleading results due to omitted factors. Since the various data sets which form the complete data set have individuals with heterogeneous background information, one has to check whether the observed discrimination is true; i.e., related to the groups, or is only a byproduct of a coinciding group division and background variable value distribution. For example, if most of the teachers in one group are female and for the second group male, and good discriminators between the groups can be found, it could be the case that sex is the true discriminating factor, but is shown through the indirect effect in the analysis. For this reason we performed an one-way analysis of variance for the background variables and factor scores, the same ones used for the discriminant analysis.

The analysis revealed that the only significant differences were related to the sex of the teachers, age or experience having no effect on their ratings. None of these differences could be identified as interfering with the results presented above. The female teachers rated themselves higher than their male counterparts for such factors as "Student-Teacher Equality", "Positively

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[8] According to Bennett (Bennett 1990, pp.53-56) Hall distinguishes between high and low contexts among different cultures. In our data the Indiana teachers represent low-context cultures, where meaning is gleaned from the verbal message itself. What is said is more important than who said it, and often the author is unknown. The Texan teachers represent high-context cultures with their large Mexican student population. In high context cultures meaning must be understood in terms of the situation or setting in which communication takes place.

Organized" and "Flexibility" (p<.000 with .1% risk). On the other hand male teachers rated themselves higher for the factor "Encouraging" (p<.003 with 1% risk).

Age did not explain the differences in teacher ratings, no significant differences being found at the .050 level. The closest to any meaningful difference could be identified for factor "Time-On-Task", which indicated that the youngest teachers (under 25) and the oldest teachers (over 55) spent less time-on-task than the teachers in the groups in between. This can be explained by the slight teaching experience of young teachers who may lack managerial skills. For the oldest teachers the situation may be different as the lack of time-on-task emphasis might be due to loss of energy and motivation as retirement age approaches.

Another interesting observation was the tendency of the teachers to become more organized with age. Though this difference was not statistically significant, it is easily explained by growing teaching experience and maturation by age, both of which help teacher to establish classroom routines.

Chapter 8

DISCUSSION

8.1. DISCUSSION ON METHODOLOGY

The model of effective teaching studied here originates in United States and is based on American teaching effectiveness research mostly dated in the 1960-1970s. Hence we have made an attempt to put the model into a more modern theoretical context by exploring different reform traditions which have affected American and Finnish teacher education in recent years. Selection of such a theoretical background is by necessity a subjective one, although an attempt to cover all the common traditions has been made. From this survey, we have attempted to identify common denominators from the various traditions. A strong candidate for such a common denominator was indeed found, in many of the traditions an autonomous, reflective teacher being a widely accepted goal for teachers' professional growth.

To reach the goal of autonomous, reflective teaching, the teacher must be supported by a methodology for professional growth. Our emphasis on the method of self-evaluation can be justified by its relative merits against e.g., a full-blown evaluation system: it is low-cost, easy to administer and can be widely applied. On the negative side, the approach suffers from the typical problems of self-evaluation such as instrument reliability and validity issues (see Section 5.5) as well as being somewhat limited in scope. In addition, building an instrument based on a set of behavior criteria for effective teaching can always be criticized for its sensitivity to the particular set of criteria selected. Thus our main concern has been the validity of the model behind the criteria. Since the model is mainly based on the American research tradition, we focused especially on the possible differences in applying the model in different teaching traditions. To be able to study the differences, the most natural way to proceed was to adopt an empirical approach and collect classroom teaching data from American and Finnish teachers using the common self-evaluation instrument. During the research the question of cross-cultural invariance of the behavior criteria model on effective teaching increased in importance. This lead us, as can be seen from the previous Chapters, to the use of various statistical methods from factor analysis to discriminant analysis. However, as almost always, the greatest contribution from the use of statistical methodology does not come from detailed results themselves, but from the new issues raised and tendencies revealed, which give information about the many-faceted nature of the concept of effective teaching.

The hypothesis that the Harris model is more readily applicable to the American classroom environment than to the Finnish teaching process was only partially supported by our analysis. There are two important aspects that affect the interpretation of the statistical results. Though sufficient for an indicative study, the sample size used is still very limited for such a multi-dimensional (approx. 100 variables) experiment. The question of representativeness can always be raised, especially since the teachers' sample in question was selected from a few geographically distant locations in the two countries. For obvious reasons the selection of a representative sample in a country as large as the United States is an intractable task for any single research experiment. However, one should not interpret this limitation too strictly as in many aspects the sample chosen is very generalizable. For example one might wonder about the possible distortion in the results caused by the low percentage of males present in the US data (about 5%). In the United States elementary teaching is considered to be much more a female profession than for males. A closer look at the statistics reveals that in fact the United States has the highest ratio between female and male first level teachers (81% female teachers) in the Western world (Anon. 1988, pp. 220-221); thus our data is very representative in this respect.

The problem of statistical representativeness is typical of any empirical study which is of similar nature to ours. The second important aspect is more specific to the topic studied, effective teaching behavior. It is very evident that effective teaching is a conceptually hierarchical construct; i.e., the higher abstraction levels are composites of more technical subconcepts. In our case this is apparent from the discussion we have presented on the second order and primary factors revealed by the exploratory factor analysis. As the model under investigation, Harris's six component performance area construct, is presented on the more abstract, second order level, the comparison is concealed by the complex interaction at the primary factor level. Consequently performing the Kaiser-Hunka-Bianchini factor structure comparison at the primary factor level was very valuable in our case. It revealed the closeness of the factor structures for the US and Finnish data, a fact that could have easily gone unnoticed in a visual inspection of the factors due to the variance of high loading variable sets.

8.2. DISCUSSION ON CONCLUSIONS

In spite of the reliability and validity issues discussed earlier, several conclusions can be drawn from the results of our empirical study.

First of all, clearly one cannot find a complete fit (i.e., match all performance areas with unique factors) between the Harris 6 component model and our data. To a large extent this could be expected, as a similar observation had already been made in our earlier preliminary study with the subject-specific data. However, in the preliminary study it was not clear to what extent the mediocre fit was due to the specific context of religious education. In the current study the subject-specific data did not behave significantly differently from the other data sets, so that one can with high confidence conclude that the previous observations are generalizable. However, even in the worst case which is represented by the Finnish data, one could identify two of the Harris's components: "Multi-Media Integrative" and "Businesslike". This is hardly a coincidence, as it is also supported by the variable level inspection – both of these components contain clear, unambiguous behavior descriptions which both the Finnish and American teaching traditions value as means for effective teaching ("Time-On-Task", "Use of audiovisual equipment" etc.). All this indicates that the underlying primary factors in the Harris model are to a high degree invariant, but the grouping into the higher, second order structures is more debatable.

The answer to the second major question of interest, "Is the Harris model construct culturally biased?" is already much more difficult to deduce from our analysis. By visual inspection the match of the six component model with the US data is unquestionably the best. One could identify counterparts for five of the Harris components: "Individually Oriented", "Multi-Media Integrative", "Stimulating", "Friendly" and "Businesslike". The only incompatible component is thus "Verbally Interactive", a component which tends to be easily confused with other components (e.g., "Stimulating" and "Businesslike"). On the other hand, for the Finnish data one can only identify two Harris components which have a clear counterpart. These observations seem to support the cultural dependency of Harris model, even with the possible distortions caused by the heterogeneity of the Finnish data set (see discussion in Section 6.6).

However, a more detailed analysis of the data performed in Chapter 7 indicates that this apparent bias is likely to be more a property of the second order structure; i.e., the particular grouping of primary factors performed by Harris, than for the elementary factor structure. Such an argument stems from the results of the explorative factor analysis for the data sets. The factor structure comparison in Section 7.6 revealed a remarkably high similarity between the two primary factor structures (the US and the Finnish data), while at the same time one could not identify a good match between the secondary structures for the same data sets (i.e., the second order factors). An obvious conclusion from this observation is that the elementary structures for effective teaching seem to be more invariant than the higher abstractions built on them.

Finally, in addition to the cross-cultural invariance questions at the model level, the results of the discriminant analysis allowed us to observe interesting differences in the evaluations of the teachers from two different teaching traditions. Conforming to the expectations that could already be derived from the theoretical framework of teaching traditions, the American teachers, as described by their self-evaluation, were much more dynamic than their Finnish colleagues. On the other hand, Finnish teachers reflected their academic tradition well by giving much more emphasis to "Time-On-Task" type of behavior. This latter academic orientation is by no means the result only of historical reasons, it has been recently re-emphasized in the context of discussion on teacher education in the European Community, where the academic level of teacher education is considered to be a indicator of a civilized nation (Uusikylä 1992). However, evidently both of the teacher education traditions could benefit by learning from each other. In fact, in the United States the concern for increasing the academic level of teacher education has already been widely acknowledged. On the other hand, for the academic tradition in Finland so far, adding aspects of more dynamic behavior to the teacher-centered teaching has not been similarly emphasized.

The work in hand offers a modest view of some of the very interesting and important aspects related to effective teaching, the various ways of understanding the concept and the issues related to the cross-cultural invariance of the notions involved. As does any study of this nature, it opens more questions than it has answered. The most promising lines of future work are related to developing alternatives to the Harris model; i.e., second order structural models, extending the cross-cultural study by including another culture (e.g., a country from the European Community) and improving the self-evaluation instrument used based on the weaknesses observed. Each of these is a formidable task of its own.

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Appendix to Chapter 5

The English questionnaire

(the variable numbering is given in *italics*)

This questionnaire is related to a cross-cultural study which aims at developing self-evaluation instruments for teachers' professional development. This same questionnaire (translated into Finnish) was used by a group of Finnish elementary teachers. The purpose of this study is to gather comparative data from United States to get information about the cultural differences in this type of a self-evaluation process. We appreciate your cooperation that makes such an interesting cross-cultural study possible.

First, please give some backround information that allows us to relate the results to a respective Finnish group. Mark the appropriate alternative or give a number if required:

Are you a

☐ male ☐ female

Your age group is

☐ under 25
☐ 25-34
☐ 35-45
☐ 45-55
☐ over 55

How many years have you been teaching __

How well do the following descriptions of classroom behaviors describe your own teaching behavior? Evaluate each of these statements on a scale from 1 to 6; 1 means that the statement doesn't describe your teaching and 6 means that the behavior describes your teaching very well. Try to use the whole scale from 1 to 6 **and circle one number only for each statement:**

4. 1 2 3 4 5 6 I inquire about students' personal accomplishments or interests.
5. 1 2 3 4 5 6 I accept disagreements.
6. 1 2 3 4 5 6 I encourage and direct students in assisting each other to assure task completion.

7. 1 2 3 4 5 6 I use a variety of styles, techniques, and approaches to present subject matter.

8. 1 2 3 4 5 6 I am an encouraging teacher.

9. 1 2 3 4 5 6 I show clarity of communication in my presentations.

10. 1 2 3 4 5 6 I initiate changes in activity for individuals who are ready while others are still busy with prior assignments.

11. 1 2 3 4 5 6 I display and/or verbalize the planned sequence of events for the lesson or period.

12. 1 2 3 4 5 6 I inform students of the objectives of my lesson.

13. 1 2 3 4 5 6 I delegate responsibilities to students in ways that keep them involved.

14. 1 2 3 4 5 6 I arrange for students to work individually.

15. 1 2 3 4 5 6 I organize classroom activities to produce a smooth flow of events with a minimum of confusion or waste of time.

16. 1 2 3 4 5 6 I adjust time frames to fit needs of students, allowing time or shifting to new activities more quickly.

17. 1 2 3 4 5 6 I provide tutorial assistance individually or guide small groups.

18. 1 2 3 4 5 6 I give clear, simple directions for shifting from one activity to another.

19. 1 2 3 4 5 6 I use with, and accept from, students such physical contacts as handshakes or pats on the back.

20. 1 2 3 4 5 6 I speak to students in encouraging way.

21. 1 2 3 4 5 6 I encourage students to share thoughts and feelings.

22. 1 2 3 4 5 6 I avoid giving negative reactions, criticisms, threats, sarcasm, etc.

23. 1 2 3 4 5 6 I interact personally with all students, balancing the attention given more aggressive and the less aggressive students.

24. 1 2 3 4 5 6 I am a warm teacher.

25. 1 2 3 4 5 6 I express interest in individuals as persons over and above being students.

26. 1 2 3 4 5 6 I regularly incorporate audio-visual materials such as television, videotape, sound film, etc., in lessons.

27. 1 2 3 4 5 6 I ask about and comment with acceptance on family and personal affairs.

28. 1 2 3 4 5 6 I am an outgoing teacher.

29. 1 2 3 4 5 6 I tell and listen to jokes, puns, or amusing incidents.

30. 1 2 3 4 5 6 I provide manipulative experiences through games, puzzles, clay, painting, drawing, construction, etc.

31. 1 2 3 4 5 6 I listen attentively when students are talking or presenting.

32. 1 2 3 4 5 6 I avoid dull routine.

33. 1 2 3 4 5 6 I am an empathetic teacher.

34. 1 2 3 4 5 6 I free students from embarrassment by using reassuring and supportive statements.

35. 1 2 3 4 5 6 I set up and provide resources for a wide variety of challenging learning activities, e.g., inquiries, experiments, simulations, case studies, interviews, brainstorming.
36. 1 2 3 4 5 6 I communicate clearly.
37. 1 2 3 4 5 6 I use a level of language students can understand.
38. 1 2 3 4 5 6 I smile openly, broadly, and frequently; and laugh freely when appropriate.
39. 1 2 3 4 5 6 I encourage and guide student responses and teacher-student interactions.
40. 1 2 3 4 5 6 I adjust pace of questioning to allow periods of silence so all students may engage in higher-level thinking.
41. 1 2 3 4 5 6 I am a personal teacher.
42. 1 2 3 4 5 6 I arrange for students to work in small groups.
43. 1 2 3 4 5 6 I organize classroom activities to produce a smooth flow of events with a minimum of confusion or waste of time.
44. 1 2 3 4 5 6 I ask for suggestions from my students.
45. 1 2 3 4 5 6 I encourage alternative answers, rephrasing to suggest responses from different students.
46. 1 2 3 4 5 6 I utilize a variety of questioning techniques which provoke different levels of thinking on the part of all students.
47. 1 2 3 4 5 6 I am an imaginative teacher.
48. 1 2 3 4 5 6 I use a variety of audio-visual and manipulative aids regularly as integral parts of lessons and assignments.
49. 1 2 3 4 5 6 I am a stimulating teacher.
50. 1 2 3 4 5 6 I express interest, enthusiasm, and curiosity about subject matter and other events.
51. 1 2 3 4 5 6 I use self-invented written materials, models, drawings, or processes.
52. 1 2 3 4 5 6 I demonstrate interest and concern for students nonverbally in a variety of ways.
53. 1 2 3 4 5 6 I improvise furniture, objects, costumes, or sets to meet unique or spontaneous needs.
54. 1 2 3 4 5 6 I draw upon students' interests and current events for content, illustrations, and applications within the classroom.
55. 1 2 3 4 5 6 I listen to students' ideas, incorporating them into the lesson and recognizing their worth.
56. 1 2 3 4 5 6 I communicate excitement, surprise, and wonder about lesson or event by inflection and by varying speaking rate, gestures, and body movement.

57. 1 2 3 4 5 6 I elaborate on subject matter by drawing from a personal knowledge base which is accurate, up-to-date, and of significant depth.

58. 1 2 3 4 5 6 I use diagnostic information about individuals' current needs in lesson planning.

59. 1 2 3 4 5 6 I organize subject matter presentations to show relationships between disciplines and connections of subject matter to the real world.

60. 1 2 3 4 5 6 I develop and administer tests and other evaluative procedures which are diagnostically scored to indicate what individuals have learned and what they need to learn.

61. 1 2 3 4 5 6 I model, and guide students in using, a wide array of higher cognitive operations, e.g., classifying, comparing, evaluating, inferring, generalizing, hypothesizing.

62. 1 2 3 4 5 6 I am well prepared for my classes.

63. 1 2 3 4 5 6 I utilize activities which allow for a high degree of student interaction - discussion, simulation, experiments, problem solving, games, inquiries.

64. 1 2 3 4 5 6 I share personal experiences.

65. 1 2 3 4 5 6 I am an interesting teacher.

66. 1 2 3 4 5 6 I maintain eye contact with students when interacting verbally with them.

67. 1 2 3 4 5 6 I refer to up-to-date bulletin boards, exhibits, interest centers, newspapers, periodicals, books, or other selected sources of information.

68. 1 2 3 4 5 6 I provide students with choices in topics for study, in activities, or in coworkers.

69. 1 2 3 4 5 6 I respond spontaneously to unplanned events, using them as reinforcers or illustrations.

70. 1 2 3 4 5 6 I maintain a planned but flexible learning environment in which unplanned events can emerge.

71. 1 2 3 4 5 6 I direct instruction in response to the unique needs and learning styles of individual students.

72. 1 2 3 4 5 6 I differentiate experiences by providing objectives, varied assignments, materials, activities, working relationships, time on task, and teacher assistance tailored to the needs of individual students.

73. 1 2 3 4 5 6 I utilize print materials which are illustrated and colorful.

74. 1 2 3 4 5 6 I direct instruction in response to the unique needs and learning styles of individual students.

75. 1 2 3 4 5 6 I provide for and process feedback to individuals about class activities and homework assignments, adjusting instructional modes, materials, or time on task if needed.

76. 1 2 3 4 5 6 I respond to individuals in ways that assist them in accomplishing their objectives.

77. 1 2 3 4 5 6 I encourage students to illustrate learning in graphic or artistic forms.

78. 1 2 3 4 5 6 I use diagnostic information about individuals' current needs in lesson planning.

79. 1 2 3 4 5 6 I decorate or arrange the classroom in ways which reinforce the theme of the lesson or the subject.

80. 1 2 3 4 5 6 I lead students in checking and correcting their own work diagnostically.

81. 1 2 3 4 5 6 I assist students in defining realistic self-development goal.

82. 1 2 3 4 5 6 I am an exciting teacher.

83. 1 2 3 4 5 6 I give directions or comments as needed to assure progress.

84. 1 2 3 4 5 6 I utilize print materials which are illustrated and colorful.

85. 1 2 3 4 5 6 I provide manipulative experiences through games, puzzles, clay, painting, drawing, construction, etc.

86. 1 2 3 4 5 6 I acknowledge student comments or responses verbally without interrupting or reducing focus on the student.

87. 1 2 3 4 5 6 I structure discussion groups to provide extended opportunities for students to verbalize and share knowledge with each other.

88. 1 2 3 4 5 6 I utilize games in ways which stimulate interest and participation without excessive competition.

89. 1 2 3 4 5 6 I provide for out-of-classroom learning in school and community setting.

90. 1 2 3 4 5 6 I arrange for laboratory experiments, special projects, or action research studies as a part of regular assignments.

91. 1 2 3 4 5 6 I direct students in using role-plays or socio-dramas in connection with their assignments.

92. 1 2 3 4 5 6 I utilize teacher-made as well as commercial and student-made materials in the classroom.

93. 1 2 3 4 5 6 I depart from standard curricular expectations to respond to urgent individual needs.

94. 1 2 3 4 5 6 I arrange all materials for easy distribution as needed during activity.

95. 1 2 3 4 5 6 I serve as participant as well as leader or observer in role-playing, discussion, or game activities.

96. 1 2 3 4 5 6 I avoid directions or comments which disrupt students.

97. 1 2 3 4 5 6 I praise student efforts, using phrases, sentences, and tonal inflections which are meaningful to the student(s) involved.

98. 1 2 3 4 5 6 I organize materials and resources for student use so that individual learners have what they need when they need it.

99. 1 2 3 4 5 6 I reflect empathy, concern, and warm liking of students as related to both school and other aspects of life.

100. 1 2 3 4 5 6 I encourage and guide students in finding their own "best" way of learning.

101. 1 2 3 4 5 6 I specify objectives in clear, explicit terms before students are given directions.

102. 1 2 3 4 5 6 I use open-ended questions to stimulate discussion.

103. 1 2 3 4 5 6 I probe in ways that keep the question open-ended and enhance student thinking.

104. 1 2 3 4 5 6 I share personal books, artifacts, experiences, reading, or other materials with the students.

The Finnish questionnaire

(the variable numbering is given in *italics*)

Tässä kyselylomakkeessa sinua pyydetään **arvioimaan omaa opetuskäytäntöäsi**. Kyseessä on siis opettajan itsearviointi omasta opetuksestaan. Tämä kysely perustuu Yhdysvalloissa kehitettyyn arviointimenetelmään ja on luonteeltaan opettajan opetustaidon kehitystä tukeva; menetelmässä pyritään opettajan jatkuvaan kehittämiseen. Menetelmä on laadittu perustuen teoreettisessa kirjallisuudessa ja tutkimustuloksissa saatuihin tuloksiin hyvästä opettamisesta.

I. Vastaa aluksi muutamiin taustatietoja koskeviin kysymyksiin.

1. Koulusi nimi ja paikkakunta

______________________________ (koulun nimi)
______________________________ (paikkakunta)

2. Oletko

__ mies __ nainen

3. Ikä

__ alle 25 vuotta
__ 25-34 vuotta
__ 35-45 vuotta
__ 46-55 vuotta
__ yli 55 vuotta

4. Montako vuotta olet toiminut opettajana? ______

5.Tänä vuonna opettamasi luokka-aste ______

6. Mihin aineisiin erikoistuit opiskeluaikana?

____
____

7. Miten ylläpidät ammattitaitoasi (voit merkitä myös useita vaihtoehtoja)?

__ opettajille järjestetyllä täydennyskoulutuksella
__ aineenhallintaan liittyvällä kirjallisuudella
__ yleisellä kasvatustieteellisellä kirjallisuudella
__ muilla tavoin, miten?

____
____

II. Missä määrin seuraavat kuvaukset soveltuvat opetukseesi? Arvioi kuvauksia asteikolla 1 - 6, siten että vaihtoehto 1 merkitsee ettei kyseinen väittämä kuvaa lainkaan opetustasi ja vaihtoehto 6 taas että se kuvaa opetustasi erittäin hyvin. Muut vaihtoehdot ovat näiden kahden äärivaihtoehdon väliltä. Koita arvioinneissasi käyttää koko annettua asteikkoa yhdestä kuuteen ja ympyröi jokaisesta kuvauksesta vain yksi numero.

4. 1 2 3 4 5 6 Tiedustelen opettaessani oppilaiden henkilökohtaisia saavutuksia tai kiinnostuksen kohteita.

5. 1 2 3 4 5 6 Hyväksyn erimielisyyttä tunnilla.

6. 1 2 3 4 5 6 Rohkaisen oppilaita auttamaan toinen toisiaan annetuissa tehtävissä.

7. 1 2 3 4 5 6 Käytän erilaisia tyylejä, tekniikoita ja lähestymistapoja esittäessäni tuntini aihetta.

8. 1 2 3 4 5 6 Olen opettaessani kannustava.

9. 1 2 3 4 5 6 Olen esityksessäni selkeä.

10. 1 2 3 4 5 6 Järjestän tuntien aikana toimintaa niille oppilaille jotka ovat jo valmiina kun muut vielä suorittavat annettuja ensisijaisia tehtäviä.

11. 1 2 3 4 5 6 Tiedotan opettaessani oppilaille asioista ja työvaiheista etukäteen ennen tuntia tai toimintajaksoa.

12. 1 2 3 4 5 6 Kerron oppilaille opetuksen tavoitteista.

13. 1 2 3 4 5 6 Jaan tunnilla vastuuta oppilaille rohkaisten heitä näin osallistumaan.

14. 1 2 3 4 5 6 Järjestän oppilaat työskentelemään itsenäisesti.

15. 1 2 3 4 5 6 Organisoin luokkahuonetoiminnan sujuvasti ilman ajanhukkaa.

16. 1 2 3 4 5 6 Sovitan tunnin aikarajat oppilaiden tarpeisiin antaen aikaa jos sitä tarvitaan tai siirtyen uuteen asiaan nopeammin.

17. 1 2 3 4 5 6 Annan ohjaavaa apua yksilöllisesti tai pienissä ryhmissä.

18. 1 2 3 4 5 6 Annan tunnilla selviä, yksinkertaisia ohjeita siirryttäessä toiminnasta toiseen.

19. 1 2 3 4 5 6 Käytän itse ja hyväksyn oppilailtani opettaessani fyysistä kosketusta esim. kädenpuristuksen, selkääntaputuksen.

20. 1 2 3 4 5 6 Puhun oppilaille kannustavalla tavalla.

21. 1 2 3 4 5 6 Rohkaisen tunnilla oppilaita jakamaan ajatuksiaan ja tunteitaan.

22. 1 2 3 4 5 6 Vältän tunnilla näyttämästä negatiivisia reaktioita, kritiikkiä, sarkasmia jne.

23. 1 2 3 4 5 6 Olen tunnilla persoonallisessa vuorovaikutuksessa kaikkien oppilaiden kanssa tasoittamalla huomiotani enemmän ja vähemmän aggressiivisten oppilaiden välillä.

24. 1 2 3 4 5 6 Olen opettaessani lämmin.

25. 1 2 3 4 5 6 Osoitan tunnilla mielenkiintoa oppilaisiin yksilöinä eikä vain pelkkinä oppilaina.

26. 1 2 3 4 5 6 Käytän televisiota, videoita tai filmejä säännöllisesti.

27. 1 2 3 4 5 6 Kysyn ja kommentoin hyväksyvästi perhe- ja henkilökohtaisia asioita.

28. 1 2 3 4 5 6 Olen opettaessani ulospäinsuuntautunut.

29. 1 2 3 4 5 6 Kerron ja kuuntelen vitsejä ja huvittavia tapahtumia.

30. 1 2 3 4 5 6 Tarjoan erilaisia elämyksiä pelejen, palapelien, maalaamisen, piirtämisen ja rakentamisen avulla.

31 1 2 3 4 5 6 Kuuntelen keskittyneesti kun oppilaat puhuvat tai esiintyvät.

32. 1 2 3 4 5 6 Vältän tylsää rutiinia.

33. 1 2 3 4 5 6 Olen opettaessani empaattinen.

34. 1 2 3 4 5 6 Pyrin auttamaan oppilaita hämmennykseltä käyttämällä auttavia ja tukevia kysymyksiä.

35. 1 2 3 4 5 6 Tarjoan mahdollisuuksia erilaisille haastaville oppimistavoille esim. kokeille, tapaustutkimuksille, haastatteluille ja aivoriihille.

36. 1 2 3 4 5 6 Kommunikoin selvästi.

37. 1 2 3 4 5 6 Käytän sellaista kieltä jota oppilaat ymmärtävät.

38. 1 2 3 4 5 6 Hymyilen avoimesti ja säännöllisesti ja nauran vapaasti kun asiaan kuuluu.

39. 1 2 3 4 5 6 Rohkaisen ja ohjaan oppilaiden vastauksia ja opettaja-oppilas vuorovaikutusta.

40. 1 2 3 4 5 6 Annan kysymyksen jälkeen oppilaille aikaa miettiä jotta he käyttäisivät myös ajattelun korkeimpia tasoja.

41. 1 2 3 4 5 6 Olen persoonallinen.

42. 1 2 3 4 5 6 Käytän ryhmätyöskentelyä opetuksen työmuotona.

43. 1 2 3 4 5 6 Pidän hyvää vauhtia tunnilla, jotta ehtisin käsitellä kaikki kurssiin kuuluvat asiat.
44. 1 2 3 4 5 6 Kysyn oppilaiden ehdotuksia.
45. 1 2 3 4 5 6 Rohkaisen vaihtoehtoisia vastauksia, asetan kysymyksen uudelleen saadakseni vastauksia muiltakin oppilailta.
46. 1 2 3 4 5 6 Hyödynnän monenlaisia kysymystyyppejä, jotta oppilaat voivat käyttää ajattelun eri tasoja.
47 1 2 3 4 5 6 Olen mielikuvitusrikas.
48. 1 2 3 4 5 6 Käytän monipuolisesti AV-välineitä ja muuta havaintomateriaalia säännöllisesti olennaisena osana tuntia.
49. 1 2 3 4 5 6 Olen stimuloiva.
50. 1 2 3 4 5 6 Ilmaisen mielenkiintoa, innostusta ja uteliaisuutta esillä olevaan asiaan ja tapahtumiin.
51. 1 2 3 4 5 6 Käytän opettaessani apuna itsetehtyjä materiaaleja, malleja, piirustuksia.
52. 1 2 3 4 5 6 Osoitan kiinnostusta ja välittämistä oppilaisiin monella tavalla muutoinkin kuin verbaalisesti.
53. 1 2 3 4 5 6 Improvisoin käyttäen huonekaluja, asioita ja pukuja täyttämään tunnin spontaanit tarpeet.
54. 1 2 3 4 5 6 Tuon oppilaiden mielenkiinnon kohteet ja ajankohtaiset tapahtumat esille esimerkkien ja sovellusten avulla.
55. 1 2 3 4 5 6 Kuuntelen huolellisesti oppilaiden ideoita, käytän niitä hyväkseni ja tuon esiin niiden arvon.
56. 1 2 3 4 5 6 Pyrin välittämään jännitystä ja hämmästystä tunnin sisällöstä tai tapahtumista vaihtelemalla puhetyyliä ja vartalon liikkeitä.
57. 1 2 3 4 5 6 Syvennän käsiteltävää asiaa kertomalla omista kokemuksista ja päivän ajankohtaisista asioista.
58. 1 2 3 4 5 6 Suunnittelen opetusohjelman joka vastaa yksittäisen oppilaan tarpeita ja oppimistyyliä.
59. 1 2 3 4 5 6 Järjestän esityksiä käsiteltävästä aiheesta osoittaakseni tunnin asian yhteyksiä elävään elämään.
60. 1 2 3 4 5 6 Arvostelen kokeita ja projekteja diagnostisesti tuomalla selvästi esiin oppilaan vahvat ja heikot puolet.
61. 1 2 3 4 5 6 Toimin esimerkkinä ja ohjaan oppilaita käyttämään erilaisia kognitiivisia operaatioita esim. määrittelemään, vertaamaan, arvioimaan, yleistämään ja olettamaan.
62. 1 2 3 4 5 6 Olen hyvin valmistautunut.
63. 1 2 3 4 5 6 Käytän opetusmenetelmiä jotka sallivat oppilaiden osallistumisen: keskustelua, ongelmanratkaisuja, leikkejä.
64. 1 2 3 4 5 6 Jaan henkilökohtaisia kokemuksia.
65. 1 2 3 4 5 6 Olen mielenkiintoinen.
66. 1 2 3 4 5 6 Säilytän katsekontaktin oppilaiden kanssa puhuessani heidän kanssaan.
67. 1 2 3 4 5 6 Viittaan opettaessani näyttelyihin, sanomalehtiin, kirjoihin ja muuhun valikoituun materiaaliin.
68. 1 2 3 4 5 6 Annan oppilaille valinnan vapautta opiskeluun, toimintoihin tai yhteistyöhön.
69. 1 2 3 4 5 6 Reagoin spontaanisti yllättäviin tapahtumiin käyttäen niitä vahvistajina tai esimerkkeinä.
70. 1 2 3 4 5 6 Säilytän suunnitellun, mutta joustavan oppimisympäristön, missä suunnittelemattomia tapahtumia sallitaan.
71. 1 2 3 4 5 6 Otan jokaisen oppilaan yksilölliset oppimistarpeet huomioon
72. 1 2 3 4 5 6 Eriytän opetusta tarjoamalla materiaaleja, toimintoja, erilaisia työtapoja, aikaa ja opettajan apua vastatakseni oppilaan tarpeisiin.
73. 1 2 3 4 5 6 Käytän painettuja materiaaleja, jotka ovat kuvitettuja ja värikkäitä.
74. 1 2 3 4 5 6 Annan ohjeita ottaen huomioon yksittäisen oppilaan erityistarpeet.
75. 1 2 3 4 5 6 Tarjoan palautetta yksilöille tuntiaktiivisuudesta ja kotitehtävien suorittamisesta.

76. 1 2 3 4 5 6 Vastaan oppilaiden kysymyksiin siten, että se auttaa heitä.

77. 1 2 3 4 5 6 Rohkaisen oppilaita oppimiseen piirtämisen tai taiteen avulla.

78. 1 2 3 4 5 6 Kerään ja analysoin diagnostista tietoa yksittäisen oppilaan tämän hetken oppimistasosta.

79. 1 2 3 4 5 6 Sisustan tai järjestän luokkahuoneen tavalla joka auttaa esillä olevan asian omaksumista.

80. 1 2 3 4 5 6 Ohjaan oppilaita tarkastamaan ja korjaamaan diagnostisesti omia töitään.

81. 1 2 3 4 5 6 Autan oppilasta asettamaan itselleen selvät, realistiset tavoitteet opiskelussa.

82. 1 2 3 4 5 6 Olen jännittävä.

83. 1 2 3 4 5 6 Annan ohjeita tai kommentteja varmistaakseni tunnilla etenemisen kun niitä tarvitaan.

84. 1 2 3 4 5 6 Käytän liitutaulua, karttoja, dioja, kuvia antaakseni oppilaille visuaalisen elämyksen uskontotunnin asiasta.

85. 1 2 3 4 5 6 Tarjoan oppilaille säännöllisesti dramatisoinnin, kielellisen vuorovaikutuksen, pelien, piirustusten ja kenttätutkimusten kokemuksia.

86. 1 2 3 4 5 6 Annan positiivista palautetta kielellisesti oppilaan kommentteihin tai vastauksiin.

87. 1 2 3 4 5 6 Järjestän keskusteluryhmiä antaakseni oppilaille mahdollisuuden olla kielellisessä vuorovaikutuksessa ja jakaa kokemuksiaan keskenään.

88. 1 2 3 4 5 6 Käytän hyväkseni kilpailuja, jotka herättävät mielenkiintoa ja aktivoivat osallistumaan ilman kilpailuhenkeä.

89. 1 2 3 4 5 6 Tarjoan oppimistilanteita luokkahuoneen ulkopuolella koulussa ja yhteisössä.

90. 1 2 3 4 5 6 Järjestän erityisiä projekteja tai toiminnallisia tutkimuksia osana tavanomaisia kotitehtäviä.

91. 1 2 3 4 5 6 Ohjaan oppilaita tunnilla roolileikkiin tai sosiodraamaan.

92. 1 2 3 4 5 6 Käytän runsaasti AV-välineitä ja erilaisia havainnollistamiskeinoja osallistuen niiden valmistamiseen.

93. 1 2 3 4 5 6 Poikkean lukusuunnitelmassa vastatakseni paremmin yksittäisen oppilaan tarpeisiin.

94. 1 2 3 4 5 6 Järjestän kaikki tunnilla tarvittavat materiaalit helposti saataville.

95. 1 2 3 4 5 6 Toimin tunnilla osallistujana sekä ohjaajana tai tarkkailijana roolileikeissä, keskusteluissa tai peleissä.

96. 1 2 3 4 5 6 Vältän ohjeita tai kommentteja jotka häiritsevät oppilasta.

97. 1 2 3 4 5 6 Rohkaisen oppilaan yrityksiä käyttäen kiitosta, lauseita tai äänenpainoja jotka ovat merkityksellisiä kyseiselle oppilaalle.

98. 1 2 3 4 5 6 Järjestän oppimateriaaleja ja muita lähteitä oppilaiden käyttöön niin, että yksittäinen oppilas saa ne käyttöönsä silloin kun niitä tarvitsee.

99. 1 2 3 4 5 6 Osoitan empatiaa, huolenpitoa ja lämpöä oppilaisiin sekä kouluun että muihin elämänalueisiin liittyvissä asioissa.

100. 1 2 3 4 5 6 Rohkaisen oppilaita löytämään heidän oma paras tapansa oppia.

101. 1 2 3 4 5 6 Pidän opetuksen tavoitteet mielessäni arvioidessani oppilaiden osaamista.

102. 1 2 3 4 5 6 Käytän avoimia kysymyksiä stimuloidakseni keskustelua ja saadakseni oppilaat ajattelemaan.

104. 1 2 3 4 5 6 Jaan tunnilla omia kirjojani, kokemuksiani, artikkeleita tai muuta materiaalia oppilaille.

DeTEK Criteria list

Performance Area	*Behaviors and Indicators*
1. BUSINESSLIKE **The teacher is organized, systematic, goal oriented, and prepared.** The teacher performs in a variety of ways that clearly reflect planning, goal orientation, prioritization, and detailed consideration of relationships between purpose, activity, sequence, materials, delegation, time constraints, and space utilization. In essence, the teacher clearly knows what is intended and facilitates its realization.	1a. *Organizes classroom activities to produce a smooth flow of events with a minimum of confusion or waste of time.* 1a (1)—Gives clear, simple directions for shifting from one activity to another. 1a (2)—Initiates changes in activity for individuals who are ready while others are still busy with prior assignments. 1a (3)—Arranges all materials for easy distribution as needed during activity. 1a (4)—Makes prompt use of supplemental activities or plan modifications to assure full use of all available time. 1a (5)—Organizes and directs clerical and housekeeping chores to prevent waste of time by teacher and students. 1b. *Informs students of objectives, sequence of events, the rationale, and responsibilities well in advance of lesson or activity.* 1b (1)—Displays and/or verbalizes the planned sequence of events for the lesson or period. 1b (2)—Specifies objectives in clear, explicit terms before students are given directions, and refers to such objectives as needed for clarification and evaluation purposes. 1b (3)—Discusses the rationale for assignments in terms of objectives, course goals, and the realities of student life. 1b (4)—Defines student responsibilities, emphasizing expectations, growth, progress, excellence, and effort. 1c. *Delegates responsibilities to students, aides, and others in ways that keep them involved and conserve teacher time and energy for the most demanding responsibilities.* 1c (1)—Assigns routine clerical and housekeeping chores to students (and aides) on a scheduled basis, dispersing the workload and conserving time. 1c (2)—Arranges for students to work individually or in small groups, defining the responsibilities of all students. 1c (3)—Leads students in evaluating their own assignments, providing all necessary materials and directions to assure objectivity. 1c (4)—Stimulates students to seek assistance from other school personnel, parents, and others in conjunction with regular course assignments. 1d. *Paces activities to assure task accomplishment, arranging for assistance for those who need it to make progress and reach goals.* 1d (1)—Surveys the progress of students toward task accomplishment, and reminds students of time allocations, urging greater speed as needed. 1d (2)—Adjusts time frames to fit needs of students, allowing time, shifting to new activities more quickly, or rescheduling target dates. 1d (3)—Provides tutorial assistance or guides small groups to assist with task accomplishment on schedule. 1d (4)—Encourages and directs students in assisting each other to assure task completion.
2. FRIENDLY **The teacher is warm, empathetic, outgoing, positive, and personal.** The teacher displays warm, friendly, personal relationships with all pupils by emphasizing the positive, avoiding negativism, being accessible to students, considering their feelings and problems, recognizing differences in interests, abilities, and experiences. In essence, the teacher clearly regards every individual and the student group as persons who are likeable, worthy, interesting, and capable.	2a. Speaks to students in *positive, praising, encouraging ways.* 2a (1)—Acknowledges student comments or responses verbally without interrupting or reducing focus on the student. 2a (2)—Praises student efforts, using phrases, sentences, and tonal inflections which are meaningful to the student(s) involved. 2a (3)—Frees students from embarrassment by using reassuring and supportive statements. 2a (4)—Avoids giving negative reactions, criticisms, threats, sarcasm, etc. 2a (5)—Interacts personally with all students, balancing the attention given the more aggressive and the less aggressive students. 2b. *Expresses interest in individuals as persons over and above being students.* 2b (1)—Seeks out individual students and groups of students for informal personal contacts. 2b (2)—Encourages students to share thoughts and feelings, reflecting and clarifying in ways that help students assess the effectiveness of their behavior patterns.

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Performance Area	*Behaviors and Indicators*
	2d (3)—Inquires about students' personal accomplishments or interests. 2b (4)—Assists students in defining realistic self-development goals. 2c. *Reflects empathy, concern, and warm liking of students as related to both school and other aspects of life.* 2c (1)—Comments sympathetically on feelings of students. 2c (2)—Asks about and comments with acceptance on family and personal affairs. 2c (3)—Shares personal experiences. 2c (4)—Encourages students to recognize peer accomplishments. 2c (5)—Tells and listens to jokes, puns, or amusing incidents. 2d. *Demonstrates interest and concern for students nonverbally in a variety of ways.* 2d (1)—Maintains eye contact with students when interacting verbally with them. 2d (2)—Listens attentively when students are talking or presenting. 2d (3)—Smiles openly, broadly, and frequently; and laughs freely when appropriate. 2d (4)—Moves close to students when assisting them, leaning, stooping, sitting, etc., as needed. 2d (5)—Uses with, and accepts from, students such physical contacts as handshakes, pats on the back, or embraces.
3. VERBALLY INTERACTIVE **The teacher listens, accepts, probes, questions, and encourages.** The teacher utilizes a variety of verbal interaction techniques to enhance clarity of communication, stimulate verbalizations by students, and provoke higher-level thought processes; and encourages students to relate talk, listening, and thinking to their various classroom learning experiences.	3a. *Communicates clearly and concisely.* 3a (1)—Gives directions or comments as needed to assure progress. 3a (2)—Avoids directions or comments which disrupt students and waste their time. 3a (3)—Uses a level of language students can understand. 3b. *Encourages and guides student responses and teacher-student interactions.* 3b (1)—Gives and asks for information and suggestions. 3b (2)—Encourages alternative answers, rephrasing to suggest responses from different students. 3b (3)—Prompts, reflects, accepts disagreements, and waits extended periods of time for students' thoughts to emerge. 3b (4)—Listens thoughtfully to students' ideas, incorparating them into the lesson and recognizing their worth. 3b (5)—Utilizes activities which allow for a high degree of student interaction—discussion, simulation, experiments, problem solving, games, inquiries. 3c. *Utilizes a variety of questioning techniques which provoke different levels of thinking on the part of all students.* 3c (1)—Uses open-ended questions to stimulate discussion, probing in ways that keep the question open-ended and enhance student thinking. 3c (2)—Adjusts pace of questioning to allow periods of silence so all students may engage in higher-level thinking. 3c (3)—Uses an array of question types, ranging from simple recognition and recall to analysis, synthesis, and evaluation.
4. STIMULATING **The teacher is imaginative, stimulating, exciting, provocative, interesting, avoiding dull routine.** The teacher expresses interest in the subject matter and activities of the class. The teacher avoids dull routines in favor of many variations in procedures, materials, and activities. The teacher utilizes student interests.	4a. *Expresses interest, enthusiasm, and curiosity about subject matter and other events.* 4a (1)—Decorates or arranges the classroom in ways which reinforce the theme of the lesson or the subject. 4a (2)—Shares personal books, artifacts, experiences, reading, or other materials with the students. 4a (3)—Uses self-invented written materials, models, drawings, or processes. 4a (4)—Improvises furniture, objects, costumes, or sets to meet unique or spontaneous needs. 4a (5)—Raises questions about others' thoughts, opinions, or ideas in ways which reinforce the theme of the lesson or event. 4a (6)—Communicates excitement, surprise, wonder about lesson or event by inflection and by varying speaking rate, gestures, and body movement. 4a (7)—Elaborates on subject matter by drawing from a personal knowledge base which is accurate, up-to-date, and of significant depth.

Performance Area ***Behaviors and Indicators***

4b. *Uses a variety of styles, techniques, and approaches to present subject matter.*

4b (1)—Organizes subject matter presentations to show relationships between disciplines and connections of subject matter to the real world.

4b (2)—Uses shifts in sensory modes, levels of thinking, interaction styles, or in location of teacher/learners to keep the lesson flowing and student interest and attention high.

4b (3)—Models, and guides students in using, a wide array of higher cognitive operations, e.g., classifying, comparing, evaluating, inferring, generalizing, hypothesizing.

4b (4)—Plans and executes presentations which are surprising, out of the ordinary, and memorable, increasing active response of the students and motivating them toward further participation.

4b (5)—Sets up and provides resources for a wide variety of challenging learning acivities, e.g., inquiries, experiments, simulations, case studies, interviews, brainstorming.

4c. *Draws upon students' interests and current events for content, illustrations, and applications within the classroom.*

4c (1)—Substitutes current problems, issues, or happenings of interest to students for those offered in commercial materials or texts, when doing so makes for lively and efficient learning.

4c (2)—Refers to up-to-date bulletin boards, exhibits, interest centers, newspapers, periodicals, books, or other selected sources of information.

4c (3)—Provides students with choices in topics for study, in activities, or in coworkers.

4c (4)—Encourages students to reveal their interests by facilitating such student-centered activities within the classroom as sharing books of particular interest, displaying artifacts, or talking about experiences or current issues.

4c (5)—Invites students to initiate projects, experiments, or other learning activities, assisting them directly when called upon.

4d. *Responds spontaneously to unplanned events, using them as reinforcers or illustrations.*

4d (1)—Maintains a planned but flexible learning environment in which unplanned events can emerge.

4d (2)—Cues students that the event is important by recognizing the event and calling attention to it.

4d (3)—Guides students in relating the event to past, present, or future learning, tying the event to specific learnings, materials, or processes.

4d (4)—Introduces extension activities as a followup to the event when doing so aids significantly in accomplishing the learning objectives set up prior to the event's occurrence.

5. INDIVIDUAL ORIENTED
The teacher treats each individual as a unique learner.

The teacher makes learning different for individuals in many ways. Intraclass groupings are utilized routinely, as well as for special occasions, along with total group instruction. Assignments are routinely differentiated to provide for individual needs with respect to objectives, time allocations, and mode of learning. Materials assigned for use are varied. Individual students are provided freedom to pursue learning tasks differently, to progress more rapidly, and to go beyond basic requirements. Teachers and students are both tutors in formal one-to-one relationships.

5a. *Collects, organizes, and analyzes diagnostic data about individual students' current learning needs.*

5a (1)—Develops and administers tests and other evaluative procedures which are diagnostically scored to indicate what individuals *have* learned and what they *need* to learn.

5a (2)—Observes students' learning styles, recording individuals' rates of learning and use of time and their preferred study skills, sensory modes, and working relationships.

5a (3)—Maintains cumulative profiles of individuals' learning behaviors, highlighting those needs which can and *will* be met through the school program.

5b. *Plans an instructional program which meets the unique needs and learning styles of individual students.*

5b (1)—Uses diagnostic information about individuals' current needs in lesson planning.

5b (2)—Departs from standard curricular expectations to respond more directly to urgent individual needs.

5b (3)—Differentiates experiences by providing objectives, varied assignments, materials, activities, working relationships, time on task, and teacher assistance tailored to the needs of individual students.

5b (4)—Organizes materials and resources for student use so that individual learners have what they need when they need it.

Performance Area — Behaviors and Indicators

5c. *Directs instruction in response to the unique needs and learning styles of individual students.*

5c (1)—Guides the work of student groups whose membership, tasks, location, and size change periodically in response to individual learning needs.

5c (2)—Provides for and processes feedback to and from individuals about class activities and homework assignments, adjusting instructional modes, materials, or time on task if needed.

5c (3)—Encourages individual initiative in pursuing learning, reinforcing such actions as seeking help from other students, bringing materials from home, moving about the room to get resources, going to the library independently, or suggesting alternatives.

5d. *Responds to individuals in ways that assist them in accomplishing their objectives.*

5d (1)—Encourages and guides students in finding their own "best" way of learning.

5d (2)—Makes self available to individual students and groups, conferring during independent study time, arranging for peer tutoring, reteaching, checking to see work is done correctly, or clarifying.

5d (3)—Recognizes and responds positively to efforts and approximate performance of learning objectives.

5d (4)—Grades papers and projects with diagnostic notations clearly indicating strengths *and* needs of students.

5d (5)—Leads students in checking and correcting their own work diagnostically.

5d (6)—Discusses graded work with individual students and small groups, assuring their recognition of ways of improving performance or overcoming difficulties.

5d (7)—Shares diagnostic profile data with individual students, helping them to set specific, realistic learning objectives.

6. MULTI-MEDIA INTEGRATIVE

The teacher provides, through diverse media, for visualization, dramatization, demonstration, manipulation, reading, and listening.

6a. *Uses a variety of audio-visual and manipulative aids regularly as integral parts of lessons and assignments.*

6a (1)—Utilizes print materials which are illustrated and colorful.

6a (2)—Uses chalkboards, charts, bulletin boards, displays, photographs, posters, slides, and transparencies to portray content visually.

6a (3)—Makes audio materials such as records and tapes a regular part of lessons.

6a (4)—Incorporates audio-visual materials such as television, videotape, sound film, etc., regularly in lessons.

6a (5)—Provides manipulative experiences through games, puzzles, clay, painting, drawing, construction, etc.

6b. *Involves students actively and regularly in such multi-sensory experiences as dramatizations, verbal interactions, games, drawings, and field studies.*

6b (1)—Directs students in using role-plays or socio-dramas in connection with their assignments.

6b (2)—Structures discussion groups to provide extended opportunities for students to verbalize and share knowledge with each other.

6b (3)—Encourages students to illustrate learning in graphic or artistic forms.

6b (4)—Utilizes games in ways which stimulate interest and participation without excessive competition.

6b (5)—Provides for out-of-classroom learning in school and community settings.

6b (6)—Arranges for laboratory experiments, special projects, or action research studies as a part of regular assignments.

6c. *Participates with students in multi-media, multi-sensory activities—demonstrating, helping, and extending learning.*

6c (1)—Utilizes teacher-made as well as commercial and student-made materials in the classroom.

6c (2)—Serves as participant as well as leader or observer in role-playing, discussion, or game activities.

6c (3)—Demonstrates and helps students understand ways of using multi-media.

6c (4)—Introduces multi-media carefully to assure student awareness of their purpose in the lessons.

6c (5)—Follows use of multi-media/sensory activities with discussion, testing, or other planned activity.

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Computer listings (available from author by request)

Variable descriptives: frequencies for the complete data

Variable descriptives: frequencies for the USA data

Variable descriptives: frequencies for the Finnish data

Appendix to Chapter 6

Computer listings (available from author by request)

Variable descriptives: means and standard deviations for the complete data

Variable descriptives: means and standard deviations for the USA data

Variable descriptives: means and standard deviations for the Finnish data

Forced oblimin 6 factor solutions for the complete data

Forced oblimin 6 factor solutions for the USA data

Forced oblimin 6 factor solutions for the Finnish data

Appendix to Chapter 7

Computer listings (available from author by request)

Correlations for the complete data

Correlations for the USA data

Correlations for the Finnish data

Explorative factor analysis with oblimin rotation for the complete data

Explorative factor analysis with oblimin rotation for the USA data

Explorative factor analysis with oblimin rotation for the Finnish data

High loading variables for the 16 factor oblimin solution for the complete data

FACTOR 1 "STIMULATING"	
NUMBER OF HIGH LOADING VARIABLES	9
HIGHEST LOADING VARIABLE	VAR 65, LOADING .817
PERCENTAGE OF VARIANCE EXPLAINED	37.0
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

65 I am an interesting teacher (.817)
82 I am an exciting teacher (.795)
49 I am a stimulating teacher (.764)
47 I am an imaginative teacher (.697)
56 I communicate excitement, surprise, and wonder about lesson or event by inflection and by varying speaking rate, gestures, and body movement (.660)
50 I express interest, enthusiasm, and curiosity about subject matter and other events.(.563)
79 I decorate or arrange the classroom in ways which reinforce the theme of the lesson or the subject (.547)
59 I organize subject matter presentations to show relationships between disciplines and connections of subject matter to the real world (.543)
7 I use a variety of styles, techniques, and approaches to present subject matter (.534)

FACTOR 2 "INTERACTION GUIDING"	
NUMBER OF HIGH LOADING VARIABLES	6
HIGHEST LOADING VARIABLE	VAR 39, LOADING .698
PERCENTAGE OF VARIANCE EXPLAINED	4.4
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

39 I encourage and guide student responses and teacher-student interactions (.698)
41 I am a personal teacher (.664)
38 I smile openly, broadly, and frequently; and laugh freely when appropriate (.636)
52 I demonstrate interest and concern for students nonverbally in a variety of ways (.633)
66 I maintain eye contact with students when interacting verbally with them (.545)
40 I adjust pace of questioning to allow periods of silence so all students may engage in higher-level thinking (.487)

FACTOR 3 "MOTIVATING STUDENTS"	
NUMBER OF HIGH LOADING VARIABLES	7
HIGHEST LOADING VARIABLE	VAR 44, LOADING .652
PERCENTAGE OF VARIANCE EXPLAINED	2.8
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

44 I ask for suggestions from my students (.652)
61 I model, and guide students in using, a wide array of higher cognitive operations, e.g., classifying, comparing, evaluating, inferring, generalizing, hypothesizing (.628)
46 I utilize a variety of questioning techniques which provoke different levels of thinking on the part of all students (.626)
54 I draw upon students' interests and current events for content, illustrations, and applications within the classroom (.623)
55 I listen to students' ideas, incorporating them into the lesson and recognizing their worth. (.610)
45 I encourage alternative answers, rephrasing to suggest responses from different students (.601)
53 I improvise furniture, objects, costumes, or sets to meet unique or spontaneous needs (.571)

FACTOR 4 "TIME-ON-TASK"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 14, LOADING .614
PERCENTAGE OF VARIANCE EXPLAINED	2.1
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

14 I arrange for students to work individually (.614)
6 I encourage and direct students in assisting each other to assure task completion (.581)
10 I initiate changes in activity for individuals who are ready while others are still busy with prior assignments (.560)
42 I arrange for students to work in small groups (.512)

FACTOR 5 "PROGRESS ASSURING VERBALITY"	
NUMBER OF HIGH LOADING VARIABLES	5
HIGHEST LOADING VARIABLE	VAR 102, LOADING .617
PERCENTAGE OF VARIANCE EXPLAINED	1.9
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

102 I use open-ended questions to stimulate discussion (.617)
99 I reflect empathy, concern, and warm liking of students as related to both school and other aspects of life (.614)
100 I encourage and guide students in finding their own "best" way of learning (.565)
96 I avoid directions or comments which disrupt students (.554)
83 I give directions or comments as needed to assure progress (.509)

FACTOR 6 "ORGANIZED COMMUNICATION"	
NUMBER OF HIGH LOADING VARIABLES	5
HIGHEST LOADING VARIABLE	VAR 18, LOADING .747
PERCENTAGE OF VARIANCE EXPLAINED	1.5
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

18 I give clear, simple directions for shifting from one activity to another (.747)
36 I communicate clearly (.729)
9 I show clarity of communication in my presentations (.702)
15 I organize classroom activities to produce a smooth flow of events with a minimum of confusion or waste of time (.611)
37 I use a level of language students can understand (.552)

FACTOR 7 "PROJECT-BASED INTEGRATIVE"	
NUMBER OF HIGH LOADING VARIABLES	7
HIGHEST LOADING VARIABLE	VAR 90, LOADING .762
PERCENTAGE OF VARIANCE EXPLAINED	1.4
NAMING BASED ON	HIGHEST LOADING

HIGH LOADING VARIABLES

90 I arrange for laboratory experiments, special projects, or action research studies as a part of regular assignments (.762)
91 I direct students in using role-plays or socio-dramas in connection with their assignments (.707)
89 I provide for out-of-classroom learning in school and community setting (.693)
68 I provide students with choices in topics for study, in activities, or in coworkers (.631)
87 I structure discussion groups to provide extended opportunities for students to verbalize and share knowledge with each other (.584)
35 I set up and provide resources for a wide variety of challenging learning activities, e.g., inquiries, experiments, simulations, case studies, interviews, brainstorming (.581)
88 I utilize games in ways which stimulate interest and participation without excessive competition (.496)

FACTOR 8 "STUDENTS' PERSONAL AFFAIRS ORIENTED"	
NUMBER OF HIGH LOADING VARIABLES	3
HIGHEST LOADING VARIABLE	VAR 29, LOADING .684
PERCENTAGE OF VARIANCE EXPLAINED	1.2
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

29 I tell and listen to jokes, puns, or amusing incidents (.684)
27 I ask about and comment with acceptance on family and personal affairs (.656)
28 I am an outgoing teacher (.519)

FACTOR 9 "ENCOURAGING"	
NUMBER OF HIGH LOADING VARIABLES	5
HIGHEST LOADING VARIABLE	VAR 8, LOADING -.720
PERCENTAGE OF VARIANCE EXPLAINED	1.1
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

8 I am an encouraging teacher (-.720)
20 I speak to students in encouraging way (-.702)
21 I encourage students to share thoughts and feelings (-.688)
24 I am a warm teacher (-.603)
25 I express interest in individuals as persons over and above being students (-.531)

FACTOR 10 "STUDENT-TEACHER EQUALITY"	
NUMBER OF HIGH LOADING VARIABLES	3
HIGHEST LOADING VARIABLE	VAR 86, LOADING .612
PERCENTAGE OF VARIANCE EXPLAINED	1.0
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

86 I acknowledge student comments or responses verbally without interrupting or reducing focus on the student (.612)
97 I praise student efforts, using phrases, sentences, and tonal inflections which are meaningful to the student(s) involved (.560)
95 I serve as participant as well as leader or observer in role-playing, discussion, or game activities (.525)

FACTOR 11 "MATERIALS INTEGRATIVE"	
NUMBER OF HIGH LOADING VARIABLES	6
HIGHEST LOADING VARIABLE	VAR 92, LOADING .631
PERCENTAGE OF VARIANCE EXPLAINED	1.0
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

92 I utilize teacher-made as well as commercial and student-made materials in the classroom (.631)
104 I share personal books, artifacts, experiences, reading, or other materials with the students (.627)
73 I utilize print materials which are illustrated and colorful (.601)
67 I refer to up-to-date bulletin boards, exhibits, interest centers, newspapers, periodicals, books, or other selected sources of information (.596)
60 I develop and administer tests and other evaluative procedures which are diagnostically scored to indicate what individuals have learned and what they need to learn (.525)
64 I share personal experiences (.514)

FACTOR 12 "GOAL-ORIENTED"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 12, LOADING .758
PERCENTAGE OF VARIANCE EXPLAINED	0.9
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

12 I inform students of the objectives of my lesson (.758)
11 I display and/or verbalize the planned sequence of events for the lesson or period (.704)
13 I delegate responsibilities to students in ways that keep them involved (.688)
101 I specify objectives in clear, explicit terms before students are given directions (.619)

FACTOR 13 "POSITIVELY ORGANIZED"	
NUMBER OF HIGH LOADING VARIABLES	5
HIGHEST LOADING VARIABLE	VAR 22, LOADING .638
PERCENTAGE OF VARIANCE EXPLAINED	0.7
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

22 I avoid giving negative reactions, criticisms, threats, sarcasm,etc (.638)
62 I am well prepared for my classes (.542)
23 I interact personally with all students balancing the attention given more agressive and less agressive students (.482)
94 I arrange all materials for easy distribution as needed during activity (.458)
7 I use a variety of styles, techniques, and approaches to present subject matter (.438)

FACTOR 14 "UNLABELED"	
NUMBER OF HIGH LOADING VARIABLES	1
HIGHEST LOADING VARIABLE	VAR 5, LOADING .447
PERCENTAGE OF VARIANCE EXPLAINED	0.7
NAMING BASED ON	NONE

HIGH LOADING VARIABLES

5 I accept disagreements (.447)

FACTOR 15 "FLEXIBILITY"	
NUMBER OF HIGH LOADING VARIABLES	6
HIGHEST LOADING VARIABLE	VAR 19, LOADING .617
PERCENTAGE OF VARIANCE EXPLAINED	0.7
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES	
19	I use with, and accept from, students such physical contacts as handshakes or pats on the back (.617)
16	I adjust time frames to fit needs of students, allowing time or shifting to new activities more quickly (.615)
58	I use diagnostic information about individuals' current needs in lesson planning (.589)
74	I direct instruction in response to the unique needs and learning styles of individual students (.525)
70	I maintain a planned but flexible learning environment in which unplanned events can emerge (.471)
69	I respond spontaneously to unplanned events, using them as reinforcers or illustrations (.465)

FACTOR 16 "EXTERNAL SOURCES INTEGRATIVE"	
NUMBER OF HIGH LOADING VARIABLES	3
HIGHEST LOADING VARIABLE	VAR 48, LOADING .686
PERCENTAGE OF VARIANCE EXPLAINED	0.7
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES	
48	I use a variety of audio-visual and manipulative aids regularly as integral parts of lessons and assignments. (.686)
26	I regularly incorporate audio-visual materials such as television, videotape, sound film, etc., in lessons. (.502)
51	I use self-invented written materials, models, drawings, or processes. (.490)

High loading variables for the 18 factor oblimin solution for the US data

FACTOR 1 "INDIVIDUALLY ORIENTED"	
NUMBER OF HIGH LOADING VARIABLES	7
HIGHEST LOADING VARIABLE	VAR 58, LOADING .663
PERCENTAGE OF VARIANCE EXPLAINED	28.5
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

58 I use diagnostic information about individuals' current needs in lesson planning (.663)
92 I utilize teacher-made as well as commercial and student-made materials in the classroom (.642)
74 I direct instruction in response to the unique needs and learning styles of individual students (.590)
98 I organize materials and resources for student use so that individual learners have what they need when they need it (.542)
60 I develop and administer tests and other evaluative procedures which are diagnostically scored to indicate what individuals have learned and what they need to learn. (540)
76 I respond to individuals in ways that assist them in accomplishing their objectives (.524)
72 I differentiate experiences by providing objectives, varied assignments, materials, activities, working relationships, time on task, and teacher assistance tailored to the needs of individual students. (.506)

FACTOR 2 "PROJECT-BASED INTEGRATIVE"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 89, LOADING -.743
PERCENTAGE OF VARIANCE EXPLAINED	4.2
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

89 I provide for out-of-classroom learning in school and community setting (-.743)
90 I arrange for laboratory experiments, special projects, or action research studies as a part of regular assignments (-.698)
91 I direct students in using role-plays or socio-dramas in connection with their assignments (-.617)
68 I provide students with choices in topics for study, in activities, or in coworkers (-.574)

FACTOR 3 "EXCITING"	
NUMBER OF HIGH LOADING VARIABLES	5
HIGHEST LOADING VARIABLE	VAR 49, LOADING -.802
PERCENTAGE OF VARIANCE EXPLAINED	3.6
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

49 I am a stimulating teacher (.802)
65 I am an interesting teacher (-.796)
82 I am an exciting teacher (-.773)
47 I am an imaginative teacher (-.690)
56 I communicate excitement, surprise, and wonder about lesson or event by inflection and by varying speaking rate, gestures, and body movement (-.666)

FACTOR 4 "EMPHATIC"	
NUMBER OF HIGH LOADING VARIABLES	8
HIGHEST LOADING VARIABLE	VAR 24, LOADING -.632
PERCENTAGE OF VARIANCE EXPLAINED	2.7
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

24 I am a warm teacher (-.632)
25 I express interest in individuals as persons over and above being students (-.609)
52 I demonstrate interest and concern for students nonverbally in a variety of ways (-.571)
33 I am an empathetic teacher (-.560)
99 I reflect empathy, concern, and warm liking of students as related to both school and other aspects of life (-.528)
34 I free students from embarrassment by using reassuring and supportive statements (-.511)
41 I am a personal teacher. (-.507)
22 I avoid giving negative reactions, criticisms, threats, sarcasm, etc (-.447)

FACTOR 5 "TIME-ON-TASK"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 14, LOADING .626
PERCENTAGE OF VARIANCE EXPLAINED	2.2
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

14 I arrange for students to work individually.(.626)
10 I initiate changes in activity for individuals who are ready while others are still busy with prior assignments .(.581)
13 I delegate responsibilities to students in ways that keep them involved (.581)
4 I inquire about students' personal accomplishments or interests (.389)

FACTOR 6 "STUDENTS' INTERESTS CONSIDERING"	
NUMBER OF HIGH LOADING VARIABLES	5
HIGHEST LOADING VARIABLE	VAR 44, LOADING .741
PERCENTAGE OF VARIANCE EXPLAINED	2.1
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

44 I ask for suggestions from my students.(.741)
55 I listen to students' ideas, incorporating them into lesson and recognizing their worth (.605)
54 I draw upon students' interests and current events for content, illustrations, and applications within the classroom (.530)
57 I elaborate on subject matter by drawing from a personal knowledge base which is accurate, up-to-date,and of significant depth (.493)
61 I model, and guide students in using, a wide array of higher cognitive operations, e.g., classifying, comparing, evaluating, inferring, generalizing,hypothesizing (.476)

FACTOR 7 "GROUP ACTIVITY ORIENTED"	
NUMBER OF HIGH LOADING VARIABLES	5
HIGHEST LOADING VARIABLE	VAR 95, LOADING .721
PERCENTAGE OF VARIANCE EXPLAINED	1.9
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

95 I serve as participant as well as leader or observer in role-playing, discussion, or game activities.(.721)
88 I utilize games in ways which stimulate interest and participation without excessive competition. (.657)
87 structure discussion groups to provide extended opportunities for students to verbalize and share knowledge with each other. (.653)
42 I arrange for students to work in small groups. (.502)
6 I encourage and direct students in assisting each other to assure task completion. (.380)

FACTOR 8 "GOAL-ORIENTED"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 12, LOADING .738
PERCENTAGE OF VARIANCE EXPLAINED	1.8
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

12 I inform students of the objectives of my lesson (.738)
11 I display and/or verbalize the planned sequence of events for the lesson or period (.611)
101 I specify objectives in clear, explicit terms before students are given directions (.588)
81 I assist students in defining realistic self-development goal (.491)

FACTOR 9 "CLARITY OF COMMUNICATION"	
NUMBER OF HIGH LOADING VARIABLES	6
HIGHEST LOADING VARIABLE	VAR 31, LOADING -.705
PERCENTAGE OF VARIANCE EXPLAINED	1.6
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

31 I listen attentively when students are talking or presenting (-.705)
9 I show clarity of communication in my presentations (-.569)
39 I encourage and guide student responses and teacher-student interactions. (-.528)
66 I maintain eye contact with students when interacting verbally with them (-.496)
36 I communicate clearly (-.485)
21 I encourage students to share thoughts and feelings (-.477)

FACTOR 10 "ORGANIZED"	
NUMBER OF HIGH LOADING VARIABLES	5
HIGHEST LOADING VARIABLE	VAR 94, LOADING .753
PERCENTAGE OF VARIANCE EXPLAINED	1.6
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

94 I arrange all materials for easy distribution as needed during activity (.753)
98 I organize materials and resources for student use so that individual learners have what they need when they need it (.633)
62 I am well prepared for my classes (.602)
15 I organize classroom activities to produce a smooth flow of events with a minimum of confusion or waste of time (.602)
18 I give clear, simple directions for shifting from one activity to another (.509)

FACTOR 11 "USE OF STIMULATING METHODS"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 51, LOADING .720
PERCENTAGE OF VARIANCE EXPLAINED	1.5
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

51 I use self-invented written materials, models, drawings, or processes (.720)
50 I express interest, enthusiasm, and curiosity about subject matter and other events (.678)
53 I improvise furniture, objects, costumes, or sets to meet unique or spontaneous needs (.520)
56 I communicate excitement, surprise, and wonder about lesson or event by inflection and by varying speaking rate, gestures, and body movement (.555)

FACTOR 12 "MULTI-STYLE TEACHING"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 51, LOADING .671
PERCENTAGE OF VARIANCE EXPLAINED	1.3
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

7 I use a variety of styles, techniques, and approaches to present subject matter (.671)
30 I provide manipulative experiences through games, puzzles, clay, painting, drawing, construction, etc (.641)
35 I set up and provide resources for a wide variety of challenging learning activities, e.g., inquiries, experiments, simulations, case studies, interviews, brainstorming.(.441)
32 I avoid dull routine (.421)

FACTOR 13 "STUDENTS' THINKING PROVOKING"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 46, LOADING -.656
PERCENTAGE OF VARIANCE EXPLAINED	1.1
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

46 I utilize a variety of questioning techniques which provoke different levels of thinking on the part of all students (-.656)
102 I use open-ended questions to stimulate discussion (-.653)
45 I engourage alternative answers, rephrasing to suggest responses from different students (-.601)
40 I adjust pace of questioning to allow periods of silence so all students may engage in higher-level thinking (-.512)

FACTOR 14 "STUDENTS' NEEDS ADAPTIVE"	
NUMBER OF HIGH LOADING VARIABLES	2
HIGHEST LOADING VARIABLE	VAR 17, LOADING .659
PERCENTAGE OF VARIANCE EXPLAINED	1.1
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

17 I provide tutorial assistance individually or guide small groups (.659)
16 I adjust time frames to fit needs of students, allowing time or shifting to new activities more quickly (.414)

FACTOR 15 "EXTERNAL SOURCES INTEGRATIVE"	
NUMBER OF HIGH LOADING VARIABLES	2
HIGHEST LOADING VARIABLE	VAR 48, LOADING -.636
PERCENTAGE OF VARIANCE EXPLAINED	1.0
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

48 I use a variety of audio-visual and manipulative aids regularly as integral parts of lessons and assignments (-.636)
26 I regularly incorporate audio-visual materials such as television, videotape, sound film, etc., in lessons (-.633)

FACTOR 16 "FLEXIBILITY"	
NUMBER OF HIGH LOADING VARIABLES	3
HIGHEST LOADING VARIABLE	VAR 70, LOADING .810
PERCENTAGE OF VARIANCE EXPLAINED	1.0
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

70 I maintain a planned but flexible learning environment in which unplanned events can emerge (.810)
69 I respond spontaneously to unplanned events, using them as reinforcers or illustrations (.611)
59 I organize subject matter presentations to show relationships between disciplines and connections of subject matter to the real world.(.411)

FACTOR 17 "UNLABELED "	
NUMBER OF HIGH LOADING VARIABLES	3
HIGHEST LOADING VARIABLE	VAR 79, LOADING .603
PERCENTAGE OF VARIANCE EXPLAINED	1.0
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

79 I decorate or arrange the classroom in ways which reinforce the theme of the lesson or the subject (.603)
20 I speak to students in encouraging way (.373)
75 I provide for and process feedback to individuals about class activities and homework assignments, adjusting instructional modes, materials, or time on task if needed (.375)

FACTOR 18 "PERSONAL FRIENDLINESS "	
NUMBER OF HIGH LOADING VARIABLES	7
HIGHEST LOADING VARIABLE	VAR 27, LOADING .696
PERCENTAGE OF VARIANCE EXPLAINED	0.9
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

27 I ask about and comment with acceptance on family and personal affairs (.696)
29 I tell and listen to jokes, puns, or amusing incidents (.679)
64 I share personal experiences (.619)
28 I am an outgoing teacher (.490)
38 smile openly, broadly, and frequently; and laugh freely when appropriate (.475)
104 I share personal books, artifacts, experiences, reading, or other materials with the students (.471)
23 I interact personally with all students, balancing the attention given more aggressive and the less aggressive students .(.413)

High loading variables for the 18 factor oblimin solution for the Finnish data

FACTOR 1 "PROJECT-BASED INTEGRATIVE "	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 90, LOADING .770
PERCENTAGE OF VARIANCE EXPLAINED	24.5
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

90 I arrange for laboratory experiments, special projects, or action research studies as a part of regular assignments (.770)
89 I provide for out-of-classroom learning in school and community setting (.728)
87 I structure discussion groups to provide extended opportunities for students to verbalize and share knowledge with each other (.564)
88 I utilize games in ways which stimulate interest and participation without excessive competition (.548)

FACTOR 2 "PERSONALITY BASED "	
NUMBER OF HIGH LOADING VARIABLES	6
HIGHEST LOADING VARIABLE	VAR 64, LOADING .709
PERCENTAGE OF VARIANCE EXPLAINED	6.8
NAMING BASED ON	HIGHEST LOADING

HIGH LOADING VARIABLES

64 I share personal experiences (.709)
57 I elaborate on subject matter by drawing from a personal knowledge base which is accurate, up-to-date, and of significant depth (.674)
66 I maintain eye contact with students when interacting verbally with them (.667)
38 I smile openly, broadly, and frequently; and laugh freely when appropriate (.403)
41 I am a personal teacher.(.416)
69 I respond spontaneously to unplanned events, using them as reinforcers or illustrations (.480)

FACTOR 3 "ORGANIZED COMMUNICATION"	
NUMBER OF HIGH LOADING VARIABLES	6
HIGHEST LOADING VARIABLE	VAR 9, LOADING .729
PERCENTAGE OF VARIANCE EXPLAINED	3.1
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

9 I show clarity of communication in my presentations (.729)
36 I communicate clearly (.684)
18 I give clear, simple directions for shifting from one activity to another (.638)
15 I organize classroom activities to produce a smooth flow of events with a minimum of confusion or waste of time(.469)
37 I use a level of language students can understand (.416)
23 I interact personally with all students, balancing the attention given more aggressive and the less aggressive students (.401)

FACTOR 4 "TIME-ON-TASK"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 10, LOADING -.624
PERCENTAGE OF VARIANCE EXPLAINED	2.7
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

10 I initiate changes in activity for individuals who are ready while others are still busy with prior assignments (-.624)
6 I encourage and direct students in assisting each other to assure task completion (-.521)
14 I arrange for students to work individually (-.582)
16 I adjust time frames to fit needs of students, allowing time or shifting to new activities more quickly (-.569)

FACTOR 5 "EMPHATIC"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 96, LOADING .601
PERCENTAGE OF VARIANCE EXPLAINED	2.5
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

96 I avoid directions or comments which disrupt students (.601)
97 I praise student efforts, using phrases, sentences, and tonal inflections which are meaningful to the student(s) involved (.568)
99 I reflect empathy, concern, and warm liking of students as related to both school and other aspects of life (.527)
33 I am an empathetic teacher (.443)

FACTOR 6 "EXCITING"	
NUMBER OF HIGH LOADING VARIABLES	5
HIGHEST LOADING VARIABLE	VAR 65, LOADING -.748
PERCENTAGE OF VARIANCE EXPLAINED	2.1
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

65 I am an interesting teacher (-.748)
82 I am an exciting teacher (-.659)
47 I am an imaginative teacher (-.599)
49 I am a stimulating teacher (-.561)
56 I communicate excitement, surprise, and wonder about lesson or event by inflection and by varying speaking rate, gestures, and body movement (.457)

FACTOR 7 "ENCOURAGING"	
NUMBER OF HIGH LOADING VARIABLES	6
HIGHEST LOADING VARIABLE	VAR 8, LOADING .740
PERCENTAGE OF VARIANCE EXPLAINED	1.8
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

8 I am an encouraging teacher (.740)
20 I speak to students in encouraging way (.660)
21 I encourage students to share thoughts and feelings (.651)
24 I am a warm teacher (.441)
25 I express interest in individuals as persons over and above being students (.426)
34 I free students from embarrassment by using reassuring and supportive statements (.408)

FACTOR 8 " STUDENT PERSONAL AFFAIRS ORIENTED"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 27, LOADING .741
PERCENTAGE OF VARIANCE EXPLAINED	1.7
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

27 I ask about and comment with acceptance on family and personal affairs (.741)
28 I am an outgoing teacher (.537)
29 I tell and listen to jokes, puns, or amusing incidents (.508)
17 I provide tutorial assistance individually or guide small groups (.402)

FACTOR 9 "PERFORMANCE INTEGRATIVE"	
NUMBER OF HIGH LOADING VARIABLES	3
HIGHEST LOADING VARIABLE	VAR 95, LOADING .433
PERCENTAGE OF VARIANCE EXPLAINED	1.6
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

95 I serve as participant as well as leader or observer in role-playing, discussion, or game activities (.433)
91 I direct students in using role-plays or socio-dramas in connection with their assignments (.414)

63 I utilize activities which allow for a high degree of student interaction - discussion, simulation, experiments, problem solving, games, inquiries (.363)

FACTOR 10 "USE OF STIMULATING METHODS"	
NUMBER OF HIGH LOADING VARIABLES	6
HIGHEST LOADING VARIABLE	VAR 59, LOADING .762
PERCENTAGE OF VARIANCE EXPLAINED	1.5
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

59 I organize subject matter presentations to show relationships between disciplines and connections of subject matter to the real world (.762)
62 I am well prepared for my classes (.590)
51 I use self-invented written materials, models, drawings, or processes. (.531)
79 I decorate or arrange the classroom in ways which reinforce the theme of the lesson or the subject (.510)
53 I improvise furniture, objects, costumes, or sets to meet unique or spontaneous needs (.473)
7 I use a variety of styles, techniques, and approaches to present subject matter (.298)

FACTOR 11 "INTERACTION GUIDING"	
NUMBER OF HIGH LOADING VARIABLES	3
HIGHEST LOADING VARIABLE	VAR 39, LOADING -.728
PERCENTAGE OF VARIANCE EXPLAINED	1.4
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

39 I encourage and guide student responses and teacher-student interactions (-.728)
52 I demonstrate interest and concern for students nonverbally in a variety of ways (-.561)
40 I adjust pace of questioning to allow periods of silence so all students may engage in higher-level thinking (-.500)

FACTOR 12 "GOAL-ORIENTED"	
NUMBER OF HIGH LOADING VARIABLES	5
HIGHEST LOADING VARIABLE	VAR 39, LOADING .627
PERCENTAGE OF VARIANCE EXPLAINED	1.3
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

13 I delegate responsibilities to students in ways that keep them involved (.627)
12 I inform students of the objectives of my lesson (.580)
11 I display and/or verbalize the planned sequence of events for the lesson or period (.555)
101 I specify objectives in clear, explicit terms before students are given directions (.475)
70 I maintain a planned but flexible learning environment in which unplanned events can emerge (.474)

FACTOR 13 "PROGRESS ASSURING VERBALITY"	
NUMBER OF HIGH LOADING VARIABLES	5
HIGHEST LOADING VARIABLE	VAR 102, LOADING -.748
PERCENTAGE OF VARIANCE EXPLAINED	1.2
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

102 I use open-ended questions to stimulate discussion (-.748)
104 I share personal books, artifacts, experiences, reading, or other materials with the students (-.697)
100 I encourage and guide students in finding their own "best" way of learning (-.491)
83 I give directions or comments as needed to assure progress (-.441)
94 I arrange all materials for easy distribution as needed during activity (-.420)

FACTOR 14 "STUDENTS' INTERESTS CONSIDERING"	
NUMBER OF HIGH LOADING VARIABLES	4
HIGHEST LOADING VARIABLE	VAR 54, LOADING .710
PERCENTAGE OF VARIANCE EXPLAINED	1.2
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

54 I draw upon students' interests and current events for content, illustrations, and applications within the classroom (.710)
55 I listen to students' ideas, incorporating them into the lesson and recognizing their worth (.707)
68 I provide students with choices in topics for study, in activities, or in coworkers (.463)
61 I model, and guide students in using, a wide array of higher cognitive operations, e.g., classifying, comparing, evaluating, inferring, generalizing, hypothesizing (.448)

FACTOR 15 "UNLABELED"	
NUMBER OF HIGH LOADING VARIABLES	2
HIGHEST LOADING VARIABLE	VAR 22, LOADING .695
PERCENTAGE OF VARIANCE EXPLAINED	1.1
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

22 I avoid giving negative reactions, criticisms, threats, sarcasm, etc (.695)
42 I arrange for students to work in small groups (-.534)

FACTOR 16 "STUDENTS' THINKING PROVOKING"	
NUMBER OF HIGH LOADING VARIABLES	3
HIGHEST LOADING VARIABLE	VAR 45, LOADING .746
PERCENTAGE OF VARIANCE EXPLAINED	1.0
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

45 I encourage alternative answers, rephrasing to suggest responses from different students (.746)
44 I ask for suggestions from my students (.614)
46 I utilize a variety of questioning techniques which provoke different levels of thinking on the part of all students (.605)

FACTOR 17 "EXTERNAL SOURCES INTEGRATIVE"	
NUMBER OF HIGH LOADING VARIABLES	6
HIGHEST LOADING VARIABLE	VAR 48, LOADING .829
PERCENTAGE OF VARIANCE EXPLAINED	0.9
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

48 I use a variety of audio-visual and manipulative aids regularly as integral parts of lessons and assignments (.829)
26 I regularly incorporate audio-visual materials such as television, videotape, sound film, etc., in lessons (.734)
92 I utilize teacher-made as well as commercial and student-made materials in the classroom (.671)
35 I set up and provide resources for a wide variety of challenging learning activities, e.g., inquiries, experiments, simulations, case studies, interviews, brainstorming (.505)
67 I refer to up-to-date bulletin boards, exhibits, interest centers, newspapers, periodicals, books, or other selected sources of information (.470)
73 I utilize print materials which are illustrated and colorful (.451)

FACTOR 18 "INDIVIDUALLY ORIENTED"	
NUMBER OF HIGH LOADING VARIABLES	6
HIGHEST LOADING VARIABLE	VAR 58, LOADING .512
PERCENTAGE OF VARIANCE EXPLAINED	0.9
NAMING BASED ON	SUMMARIZING

HIGH LOADING VARIABLES

58 I use diagnostic information about individuals' current needs in lesson planning (-.512)
5 I accept disagreements (.472)
72 I differentiate experiences by providing objectives, varied assignments, materials, activities, working relationships, time on task, and teacher assistance tailored to the needs of individual students (-.438)
74 I direct instruction in response to the unique needs and learning styles of individual students (-.406)
80 I lead students in checking and correcting their own work diagnostically (-.349)
81 I assist students in defining realistic self-development goal (-.347)

Computer listings (available from author by request)

Second order 4 factor oblimin solution for the USA data

Second order 5 factor oblimin solution for the Finnish data

Discriminant analysis solution for the complete data

One way variance analysis solution for the complete data

Factor structure comparison between the US and Finnish data by Kaiser-Hunka-Bianchini method (FACTREL)

(Observe that the variable numbering in FACTREL is different than the other computer listings: for technical reasons FACTREL numbering scheme always begins from number 1; thus for example variable 4 in the study is represented by variable 1 in the FACTREL listing. In Section 7.6 text we have used the "true" variable numbers, not the FACTREL numbering)

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F A C T R E L

Factor Comparisons Via the Kaiser-Hunka-Bianchini Method.


$Enter title of run:

$Number of variables:
$Number of factors in set 1:
$Number of factors in set 2:
$File name for set 1:
$File name for set 2: (press ENTER if same):

 Select a processing option:
   1 = Compare orthogonal factors: Input loadings matrices.
   2 = Compare oblique factors: Input factor pattern and
       factor correlation matrices.
   3 = Compare oblique factors: Input factor structure and
       factor correlation matrices.
$Enter option:

 Select a printing option:
   1 = Basic output only
   2 = Basic output plus printing of input matrices
   3 = Include intermediate results (for testing)
$Enter option:


 Cosines between the two sets of factors

 (Rows = SET 1, Cols = SET 2)

             1      2      3      4      5      6      7      8      9     10
   1     0.268  0.539  0.183 -0.242  0.340 -0.059  0.087 -0.036  0.251  0.311
   2    -0.813  0.095  0.063  0.111 -0.037  0.187 -0.103 -0.188 -0.058 -0.253
   3    -0.081 -0.127 -0.169  0.031 -0.225  0.866 -0.208 -0.140 -0.049 -0.364
   4     0.024 -0.225 -0.039  0.299 -0.462  0.234 -0.454 -0.373 -0.329  0.191
   5     0.308  0.328  0.131 -0.603 -0.330 -0.332  0.099  0.179  0.176 -0.101
   6     0.153  0.158  0.202 -0.361  0.268 -0.260  0.132  0.107 -0.097 -0.099
   7     0.342  0.177 -0.227 -0.280  0.497 -0.076  0.027  0.423  0.487  0.311
   8     0.248 -0.088  0.051 -0.208  0.204 -0.065  0.026  0.193 -0.280  0.273
   9     0.019 -0.395 -0.473  0.012 -0.044 -0.083 -0.548 -0.330 -0.233  0.005
  10     0.071  0.083  0.707 -0.315  0.282 -0.164 -0.077  0.044  0.250  0.364
  11    -0.062  0.278 -0.007 -0.510 -0.001 -0.164  0.431  0.459 -0.142  0.593
  12     0.255 -0.273  0.133  0.014 -0.085 -0.262  0.410  0.136  0.445  0.301
  13    -0.181 -0.300 -0.050  0.001 -0.253  0.050 -0.054 -0.099  0.008 -0.170
  14     0.275  0.104  0.515 -0.433  0.117 -0.032  0.064  0.272  0.172  0.307
  15    -0.055  0.254  0.108  0.114  0.121  0.069  0.323 -0.089 -0.019 -0.019
  16     0.417  0.469 -0.187 -0.181  0.175 -0.152  0.205 -0.069  0.222  0.339
  17     0.325  0.180  0.239 -0.193  0.468 -0.109  0.473 -0.018 -0.168 -0.097
  18     0.232  0.431  0.153  0.069  0.055 -0.397  0.056  0.763  0.058  0.034

            11     12     13     14     15     16     17     18
   1     0.045  0.189 -0.289  0.328  0.099  0.157  0.473 -0.460
   2    -0.186  0.115  0.361 -0.414  0.133  0.045 -0.293  0.026
   3     0.215 -0.115  0.359 -0.252  0.327 -0.182 -0.267  0.143
   4     0.520 -0.071  0.289 -0.158 -0.418  0.123  0.068  0.029
   5    -0.098  0.354 -0.271 -0.047 -0.183  0.147  0.194 -0.124
   6    -0.192  0.191 -0.128  0.677 -0.222  0.614  0.071  0.061
   7    -0.002  0.354 -0.289  0.166 -0.452  0.347  0.152 -0.105
   8    -0.073  0.730 -0.326  0.230 -0.125  0.050  0.046 -0.490
   9     0.232 -0.305  0.374 -0.309  0.292 -0.007 -0.103 -0.119
  10    -0.125  0.397 -0.250  0.037  0.188  0.121  0.196  0.302
  11    -0.227  0.136 -0.100  0.196 -0.141  0.355  0.353 -0.032
  12    -0.110  0.299 -0.082  0.151  0.135  0.509  0.401 -0.271
  13     0.327 -0.095  0.794 -0.085  0.025 -0.575 -0.157  0.047
  14    -0.514  0.039 -0.103  0.091 -0.310  0.312  0.020 -0.430
  15     0.191 -0.068  0.125 -0.146  0.355  0.012 -0.710 -0.075
  16    -0.564  0.446 -0.204  0.405 -0.155  0.267  0.168  0.108
  17    -0.186  0.317 -0.026 -0.318 -0.143  0.124  0.314  0.037
  18    -0.345  0.234 -0.082  0.235  0.027  0.349  0.209  0.017
```

BEST COPY AVAILABLE

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Cosines for between-sets variable pairs

         1      2      3      4      5      6      7      8      9     10
     0.542  0.530  0.658  0.831  0.789  0.773  0.776  0.771  0.803  0.826

        11     12     13     14     15     16     17     18     19     20
     0.680  0.885  0.676  0.803  0.881  0.576  0.873  0.744  0.454  0.485

        21     22     23     24     25     26     27     28     29     30
     0.755  0.859  0.761  0.759  0.799  0.635  0.830  0.744  0.620  0.713

        31     32     33     34     35     36     37     38     39     40
     0.600  0.908  0.731  0.510  0.677  0.798  0.841  0.786  0.775  0.661

        41     42     43     44     45     46     47     48     49     50
     0.805  0.776  0.905  0.911  0.870  0.719  0.755  0.883  0.773  0.735

        51     52     53     54     55     56     57     58     59     60
     0.719  0.714  0.715  0.634  0.743  0.656  0.871  0.564  0.854  0.725

        61     62     63     64     65     66     67     68     69     70
     0.844  0.735  0.785  0.786  0.768  0.705  0.793  0.619  0.843  0.889

        71     72     73     74     75     76     77     78     79     80
     0.710  0.801  0.585  0.749  0.767  0.865  0.771  0.678  0.893  0.696

        81     82     83     84     85     86     87     88     89     90
     0.740  0.954  0.803  0.640  0.628  0.865  0.763  0.718  0.768  0.742

        91     92     93     94     95
     0.723  0.699  0.697  0.831  0.700

Summary statistics for variable cosines:

   Minimum        =  0.454
   Maximum        =  0.954
   Median         =  0.759
   Mean (raw)     =  0.747
   Mean z-value   =  1.010
   Mean (z-to-r)  =  0.766

$Save factor cosines (Y/N)?
$Enter file name:

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 END OF RUN: Chapter 7
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